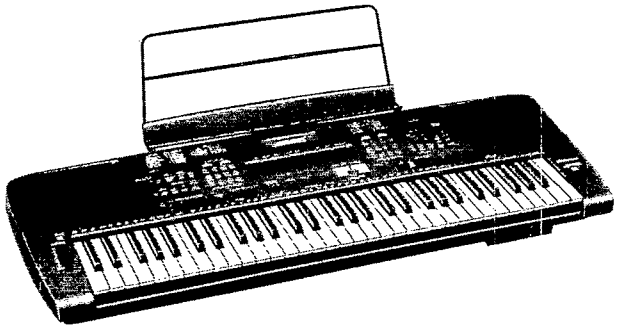
ORDER NO. EMID951585
A5

Service Manual

PCM Keyboard

SX-KN901

(M), (MC), (XM), (EN), (EH), (EF), (EZ), (EW), (EA), (EP), (EK), (XL), (XR), (XS), (XD), (XT), (X), (XP)



AREAS

(M): U.S.A.
(MC): Canada
(XM): Mexico
(EN): Norway, Sweden, Denmark, Finland
(EH): Holland, Belgium
(EF): France, Italy
(EZ): Germany
(EW): Switzerland
(EA): Austria
(EP): Spain, Portugal, Greece, Singapore
(EK): the United Kingdom
(XL): New Zealand
(XR): Australia
(XS): Malaysia, South Africa
(XD): Saudi Arabia, Hong Kong, Kuwait
(XT): Taiwan
(X): Thailand, Indonesia, Iran, U.A.E., Panama, Argentina, Peru, Brasil
(XP): Philippines

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

■ Specifications

KEYBOARD	61 KEYS (WITH INITIAL TOUCH)
SOUND GENERATOR	PCM
MAXIMUM NUMBER OF NOTES PRODUCED SIMULTANEOUSLY	32 NOTES
SOUNDS	200 SOUNDS
EFFECTS	DIGITAL EFFECT, SUSTAIN, CHORUS/FLANGER, REVERB/PHASER, PITCH BEND
PART SELECT	RIGHT 1, RIGHT 2, LEFT
TRANSPOSE	G-C-F#
RHYTHM	100 RHYTHMS + 100 VARIATIONS
CONTROLS	MAIN VOLUME, BALANCE, CONDUCTOR, START/STOP, INTRO & ENDING, FILL IN 1, FILL IN 2, VARIATION, COUNT INTRO , SYNCHRO & BREAK, TEMPO, SPLIT POINT, MUTE
MANUAL SEQUENCE PADS	14 BANKS × 3 (MEMORY: 3 BANKS × 3), RECORD/STOP
AUTO PLAY CHORD	ONE FINGER, FINGERED, PIANIST, MEMORY, ON BASS, MUSIC STYLE ARRANGER, SOUND ARRANGER
ONE TOUCH PLAY	○
TECHNI-CHORD	○
PANEL MEMORY	2 BANKS × 5, SET
SEQUENCER	16 TRACKS STORAGE CAPACITY : APPROX. 19000 NOTES INPUT MODES : EASY RECORD, REALTIME RECORD, STEP RECORD (CHORD, RHYTHM)
COMPOSER	5 PARTS : BASS, ACCOMP 1, ACCOMP 2, ACCOMP 3, DRUMS STORAGE CAPACITY : APPROX. 8600 NOTES INPUT MODES : REALTIME RECORD FUNCTIONS : COMPOSER LOAD, CLEAR, MODE SELECT, PERCUSSION ERASE, BEND RANGE MEMORY : 2 BANKS × 10 (MEMORY 1-6, INTRO, FILL IN 1, FILL IN 2, ENDING)
DISK DRIVE	3.5 INCH DISK DRIVE FOR 2HD (1.44 MB), 2DD (720 KB) DISK LOAD (TECHNICS, SMF), DISK SAVE (TECHNICS, SMF), DISK FORMAT, LOAD SINGLE COMPOSER PATTERN, LOAD SINGLE SOUND MEMORY
SOUND SETTING MENU	PART SETTING, TOUCH & TUNE, TECHNI-CHORD TYPE, LEFT HOLD, REVERB & PHASER, CHORUS & FLANGER

Technics

© 1995 Matsushita Electric Industrial CO. , LTD. All rights reserved.
Unauthorized copying and distribution is a violation of law.

SOUND EDIT	TONE SHUFFLE, OCTAVE, VIBRATO, AUTO BEND, ENVELOPE, FILTER, DIGITAL EFFECT MEMORY: 36
MODE SET	INITIAL, KEYBOARD SETUP (FOOT SWITCH SETTING, LCD CONTRAST), KEYBOARD SCALING, SEQUENCER CLEAR, SEQUENCER QUANTIZE, TRACK ASSIGN, MEDLEY PLAY, MIDI SETTING (PART SETTING, CONTROL MESSAGE, OTHER SETTINGS, PRESETS, BULK DUMP), GM MODE SET
DISPLAY	LCD (16 CHARACTERS × 2 LINES) EXIT, DISPLAY HOLD
DEMO	O
TERMINALS	PHONES, LINE OUT (R/R+L, L), FOOT SW, EXP PEDAL, MIDI (IN, OUT, THRU)
OUTPUT	8 W × 2
SPEAKERS	12 cm × 2
POWER REQUIREMENT	65 W, 50 W (NORTH AMERICA AND MEXICO)
	AC120/220/240 V 50/60 Hz AC120 V 60 Hz (NORTH AMERICA AND MEXICO) AC230 V 50/60 Hz (NEW ZEALAND) AC 230-240 V 50/60 Hz (EUROPE)
DIMENSIONS (W × H × D)	99.8 cm × 11.8 cm × 35.1 cm (39-9/32" × 4-21/32" × 13-13/16") WITHOUT MUSIC STAND
NET WEIGHT	8.0 Kg (17.6 lbs.) WITHOUT MUSIC STAND
ACCESSORIES	MUSIC STAND, AC CORD, RHYTHM PATTERN DISK

*Specification are subject to change without notice for further improvement.

WARNING

To prevent the risk of fire, smoke, or electrical shock and to ensure safe operation, please be sure to follow the safety guidelines below.

1. At places where special caution is required, the necessary safety precautions are clearly labeled or printed, for example, on the cabinet, or on the part concerned. Please follow these safety precautions, and also those listed in the Owner's Manual.

2. Parts which have a ⚠ mark in the circuit diagram or in the parts list are essential for safety. When replacing these parts, be sure to use only the specified parts.

3. Use the specified types for internal wiring (double-insulated wiring, etc.).

4. When replacing parts on the AC primary side (power transformer, electric switch, electrical cord, noise-prevention condenser, etc.), wind the lead wire and secure it by soldering.

5. Do not let the wiring come into contact with heat-emitting devices (fuse resistor, radiator plate, etc.).

6. When replacing the wiring, make sure that it is not in contact with the unfinished or rough edge of a part.

7. When replacing the power cord (except for the plug-in type), tug it from various directions to confirm that it does not slip out of place.

8. Spacing
   If soldering was done on the AC primary circuit, confirm that the interval between the soldered terminals or between the terminal and surrounding metallic parts is at least the minimum required (Between the primary circuit and the chassis: at least 6.5 mm; between primary circuit terminals: at least 4.0 mm; between primary circuit terminals and secondary circuit terminals: at least 6.5 mm.).

CONTENTS

■ **INTRODUCTION**

SAFETY PRECAUTION I-2
INITIAL SETTING I-3
TERMINALS I-3
ARRANGEMENT OF CONTROL PANEL I-4
CONDUCTOR SETTINGS I-6
PARTS LOCATION I-7
KEYBOARD RANGES I-7
DISASSEMBLY INSTRUCTIONS I-8
SYMPTOMS WHICH APPEAR
TO BE SIGNS OF TROUBLE I-10
ERROR DISPLAY I-12
ABOUT THE SELF-DIAGNOSTIC FUNCTION I-13
MIDI IMPLEMENTATION CHART I-15
PRECAUTIONS BEFORE SERVICING I-17

■ **SCHEMATIC DIAGRAM**

WIRING CONNECTION Diagram II-1
BLOCK Diagram II-3

MAIN MAIN P. C. Board II-5
MAIN MAIN P. C. Diagram II-7
FAJ ACP FAJ/ACP P. C. Diagram II-10
FAJ ACP FAJ/ACP P. C. Board II-13
CP1 CP2 CP3
CP1/CP2/CP3 P. C. Board II-16
CP1 CP2 CP3
CP1/CP2/CP3 P. C. Diagram II-19
MKB1 MKB2 MKB3 BEND
MKB1/MKB2/MKB3/BEND Circuit II-22

■ **REPLACEMENT PARTS LIST**

P. C. Board/WIRING III-1
CABINET PARTS LOCATION III-5
CABINET/CHASSIS PARTS LIST III-7
PACKING III-8

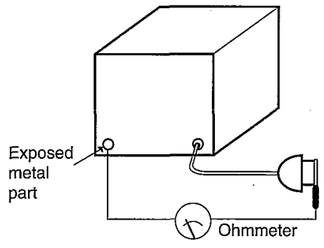
SAFETY PRECAUTION (This "safety precaution" is for the U.S.A. only)

● Safety Precaution

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc..
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

● Insulation Resistance Test

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screw heads, connectors, control shafts, handle brackets, etc..Measurements should range from 4 MΩ to infinity for all exposed parts.

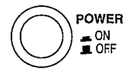


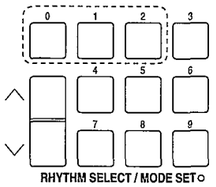
Resistance = 4MΩ to ∞

INITIAL SETTING

■ The initial setting function is used to return to the original factory settings, and to reset the customer settings and misoperations.

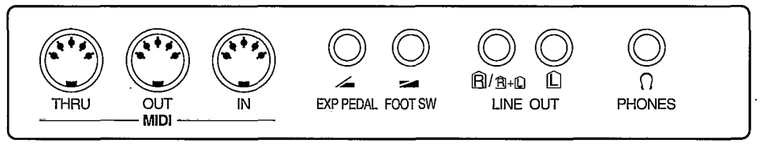
1. Press the **POWER** button to turn off the instrument.
2. While pressing the **0**,**1** and **2** buttons on the **RHYTHM SELECT** number pad at the same time, turn the **POWER** button on again.





NOTE:
All stored data in the **SEQUENCER** and **COMPOSER** and other setting are initialized with this operation.

TERMINALS



(on the rear panel)

MIDI (Musical Instrument Digital Interface)
MIDI is the standard specification that enables connection to equipment such as synthesizers and personal computers. Data transmission and reception are possible between the Technics Keyboard and other instruments provided with MIDI terminals.

IN : The terminal that receives data from external equipment.
OUT : The terminal that transmits data from this instrument to external equipment.
THRU: The terminal that transfers data from the **IN** terminal directly to other equipment.
• Use a 5-pin DIN cord (less than 15 m long) for these connections.

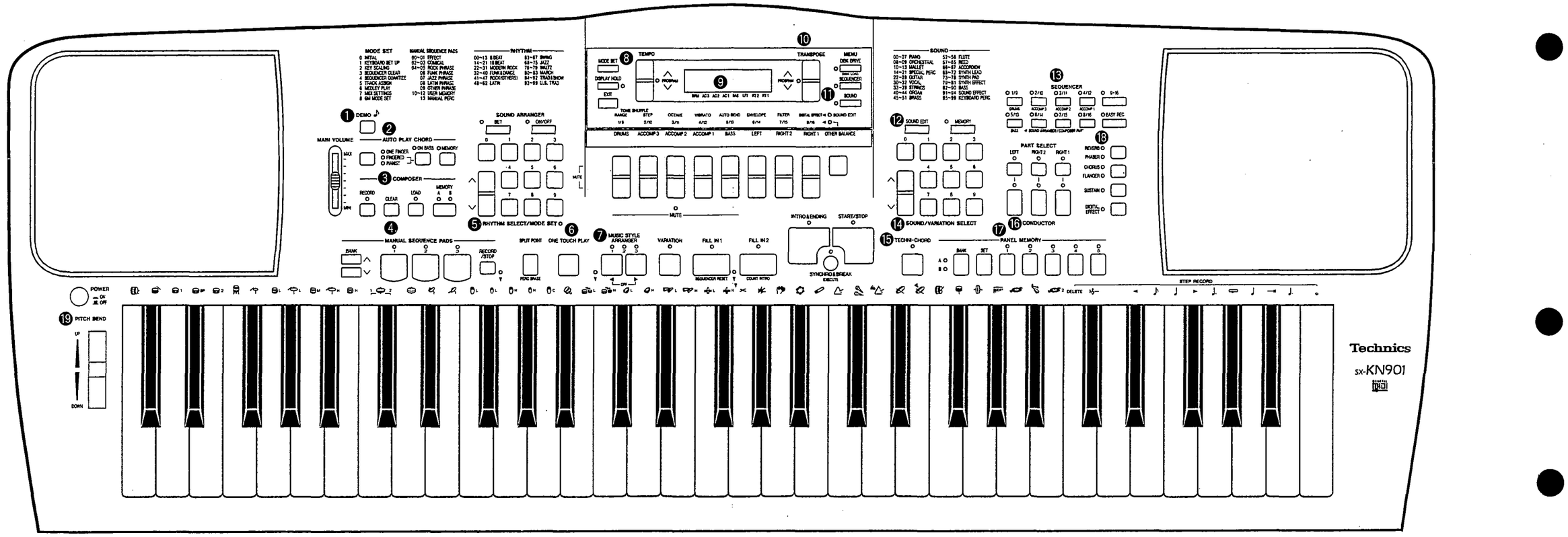
EXP PEDAL
The optional SZ-E2 Expression Pedal can be connected to this terminal to control the volume.

FOOT SW
The optional SZ-P1 Foot Switch can be connected to this terminal to control various functions.

LINE OUT (Output level 1.5 Vrms, 600 Ω)
By connecting an external high-power amplifier, the sound can be reproduced at a high volume. To output monaural sound, connect the external equipment to the **R/R+L** terminal. (Do not connect the **L** terminal.)

PHONES (🎧)
For silent practice headphones may be used. When plugged in, the speaker system is automatically switched off, and sound is heard only through the headphones.

ARRANGEMENT OF CONTROL PANEL



1 DEMO
Pre-recorded performances are used to demonstrate the individual appeal of the rhythms, sounds and other features.

2 AUTO PLAY CHORD
This feature is activated when the **ONE FINGER** , **FINGERED** or **PIANIST** button is turned on. An automatic accompaniment appropriate for the selected rhythm is produced when you play a chord. **MEMORY** allows you to continue the accompaniment even after the chord keys are released. The volume for each part of the **AUTO PLAY CHORD** (**DRUMS, BASS, ACCOMP 1, 2, 3**) is adjusted with the respective balance buttons below the display.

3 COMPOSER
Create original rhythm patterns, either in realtime or with the step record method, or modify preset rhythms. Store up to 12 new rhythms in the reserved memory locations and recall them as you play, just like the preset rhythms.

4 MANUAL SEQUENCE PADS
Add colourful phrases to your performance with the pad buttons.

5 RHYTHM SELECT
Various rhythm patterns are stored in the instrument's memory. Other rhythm controls are **START/STOP**, **SYNCHRO & BREAK**, **INTRO & ENDING, VARIATION, COUNT INTRO** and **FILL IN 1** and **2**. The volume is adjusted with the **DRUMS** balance buttons below the display.

6 ONE TOUCH PLAY
Select a rhythm and press the **ONE TOUCH PLAY** button until the panel settings change. The sounds and effects perfect for the selected rhythm are automatically set in seconds.

7 MUSIC STYLE ARRANGER
A tap of a button during your performance changes the rhythm and sounds to a simpler or flashier arrangement to match the feeling of the music.

8 MODE SET
The settable functions in this mode include initialization, keyboard set up, and setting related to MIDI operation.

9 DISPLAY
Displays performance information, function settings and other messages.

10 TRANSPOSE
C is the standard setting, but you can raise or lower the key of the entire instrument with these two buttons. The transposed key is shown on the normal performance display.

11 SOUND
This button is used for making the various sound, volume and effect settings for each part, as well as tuning and **TECHNI-CHORD** type, by reading the display.

12 SOUND EDIT
Modify preset sounds to create new and unique sounds.

13 SEQUENCER
With this feature you can separately play and record the parts for an entire song. Then have the whole ensemble performance played back automatically. This is a true 16-track sequencer, with full realtime recording, step recording and editing features.

14 SOUND/VARIATION SELECT
Various sounds are stored in the instrument's memory.

15 TECHNI-CHORD
Chord notes played on the left section of the keyboard are added to melody notes played on the right section.

16 CONDUCTOR
These buttons allow you to assign a different sound to each part, and then assign the desired part to the entire keyboard, assign a different part to each section of the keyboard, or mix parts. When the keyboard is divided into sections, change the dividing point with the **SPLIT POINT** button.

17 PANEL MEMORY
Set up the sounds and effects, and then store them in these 10 memories (2 BANKS X 5 memory locations) buttons for instant recall as you play. You can expand the range of storable settings to include the rhythm selection, tempo setting and more.

18 Effects
Turn the **REVERB** button on to add reverberation to the sound. **CHORUS** gives the sound a thickness and diffusion. When **SUSTAIN** is on, the musical tones fade gradually after the keys are released.

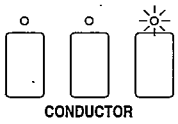
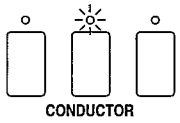
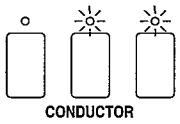
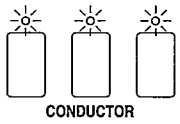
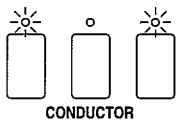
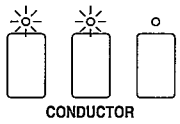
19 PITCH BEND
This wheel is moved up or down with your hand to create a continuous change in pitch. The wheel returns to the center position automatically when it is released.

DISK DRIVE
This Disk Drive allows you to store up to 20 **SEQUENCER** performances and other data on 3.5-in. 2DD or 2HD memory disk.

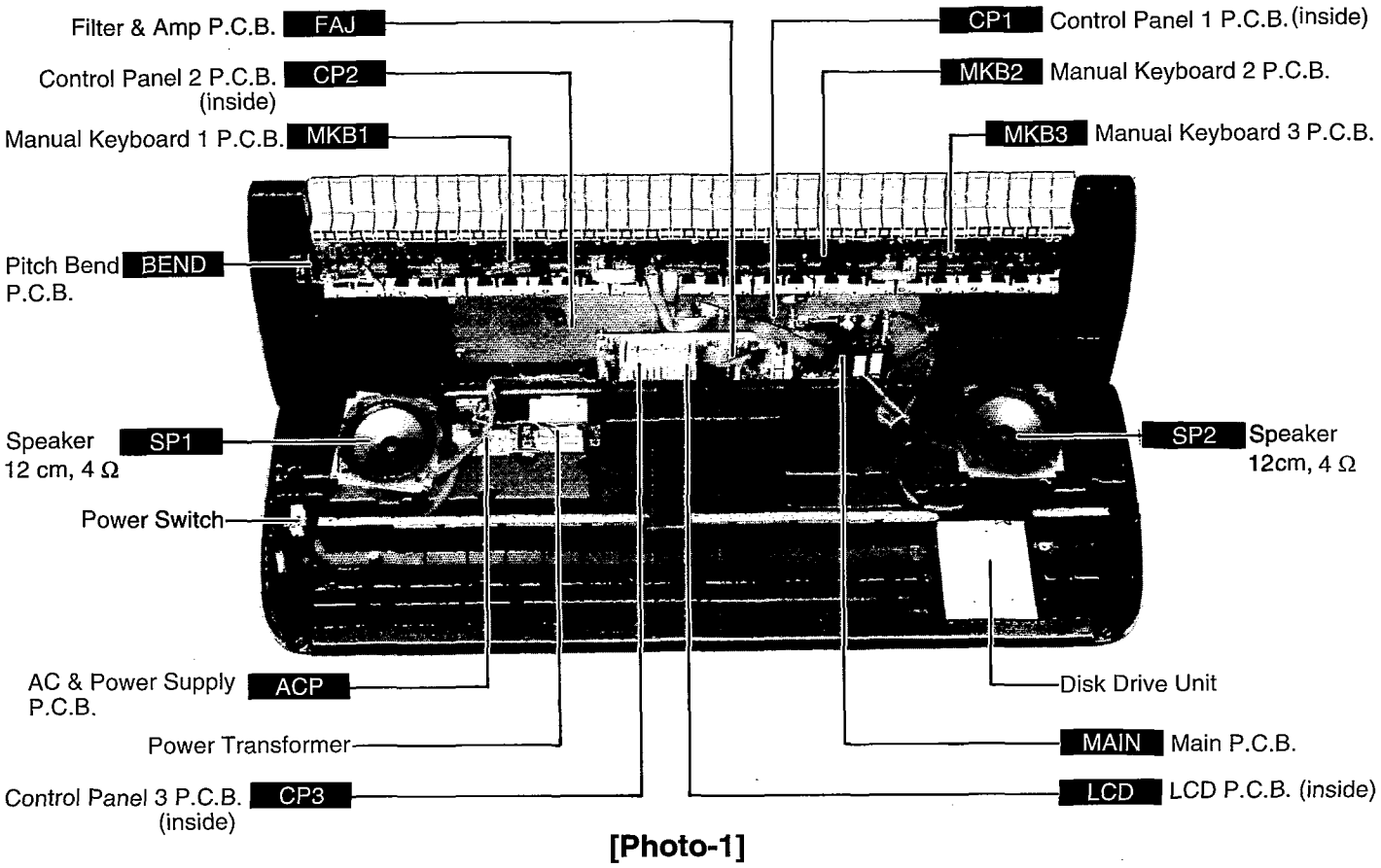
CONDUCTOR SETTINGS

The **CONDUCTOR** buttons are used to assign sounds to the keyboard in many different ways. For example, you can assign two sounds to the entire keyboard so that playing one key will produce two sounds. You can even split the keyboard into right and left sections (**SPLIT**), and assign a different sound to each section.

CONDUCTOR

CONDUCTOR settings	How sounds are assigned to the keyboard
	All keys produce the **RIGHT 1** sounds. **RIGHT 1**
	All keys produce the **RIGHT 2** sounds. **RIGHT 2**
	All the keys play both **RIGHT 1** and **RIGHT 2** sounds at the same time. **RIGHT 1 + RIGHT 2**
	The left keys produce the **LEFT** sound and the right keys produce the **RIGHT 1** sound and the **RIGHT 2** sound (SPLIT). **LEFT** | **RIGHT 1 + RIGHT 2**
	The left keys produce the **LEFT** sound and the right keys produce the **RIGHT 1** sound (SPLIT). **LEFT** | **RIGHT 1**
	The left keys produce the **LEFT** sound and the right keys produce the **RIGHT 2** sound (SPLIT). **LEFT** | **RIGHT 2**

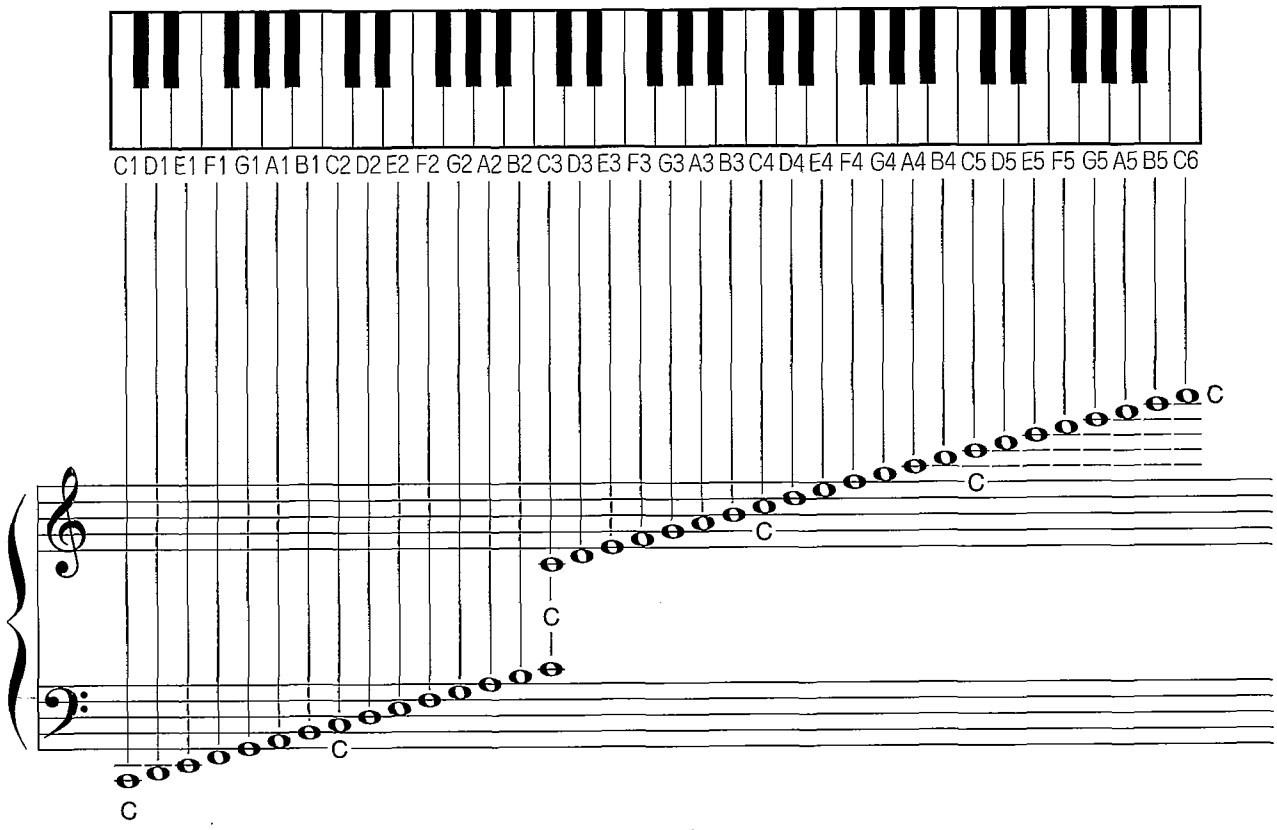
PARTS LOCATION


Filter & Amp P.C.B. FAJ
Control Panel 2 P.C.B. (inside) CP2
Manual Keyboard 1 P.C.B. MKB1
Pitch Bend P.C.B. BEND
Speaker 12 cm, 4 Ω SP1
Power Switch
AC & Power Supply P.C.B. ACP
Power Transformer
Control Panel 3 P.C.B. (inside) CP3
CP1 Control Panel 1 P.C.B. (inside)
MKB2 Manual Keyboard 2 P.C.B.
MKB3 Manual Keyboard 3 P.C.B.
SP2 Speaker 12cm, 4 Ω
Disk Drive Unit
MAIN Main P.C.B.
LCD LCD P.C.B. (inside)

[Photo-1]

KEYBOARD RANGES

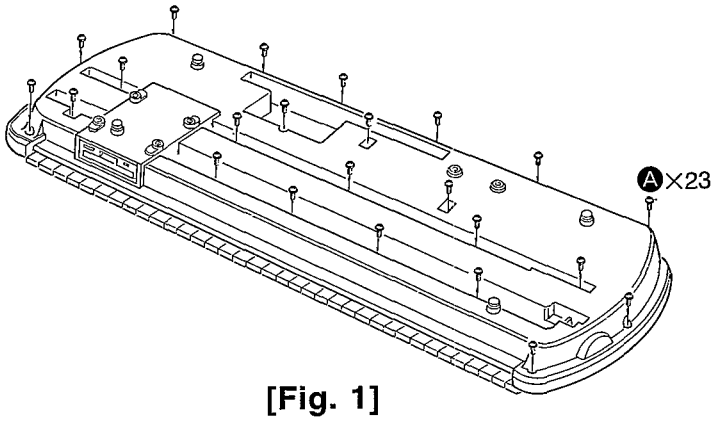
This keyboard features Touch Response, by which you control the volume by playing the keys harder or softer.



DISASSEMBLY INSTRUCTIONS

1 Opening the cabinet

1. Turn the keyboard cabinet upside down as shown in Fig. 1, and remove the bottom screws (Ⓐ 23 pcs.).
2. Place the keyboard bottomside down, and open the top cabinet .



[Fig. 1]

2 Removing the MAIN, FAJ, LCD, CP1, CP2 and CP3 printed circuit boards

• Open the cabinet (see step 1).

MAIN P.C.B.

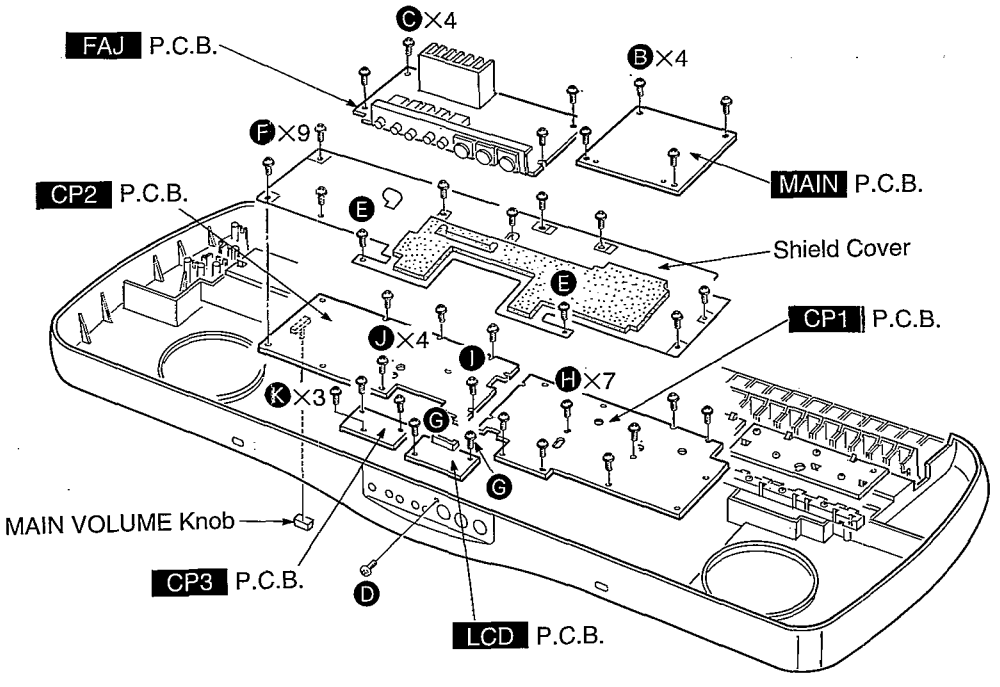
• Remove the MAIN P.C.B. mounting screws (Ⓑ 4 pcs.).

FAJ P.C.B.

• Remove the FAJ P.C.B. mounting screws (Ⓒ 4 pcs., Ⓓ 1 pc. and Ⓔ 2pcs.).

LCD, CP1, CP2, CP3 P.C.B.

1. Remove the MAIN and FAJ P.C.B..
2. Remove the shield cover mounting screws (Ⓕ 9 pcs.).
3. Remove the LCD P.C.B. mounting screws (Ⓖ 2pcs.).
4. Pull off the **MAIN VOLUME** knob.
5. Remove the CP1, CP2 and CP3 P.C.B. mounting screws (Ⓗ 7 pcs., Ⓘ 1pc., Ⓙ 4pcs. and Ⓚ 3pcs.).



[Fig. 2]

3 Removing the ACP printed circuit board

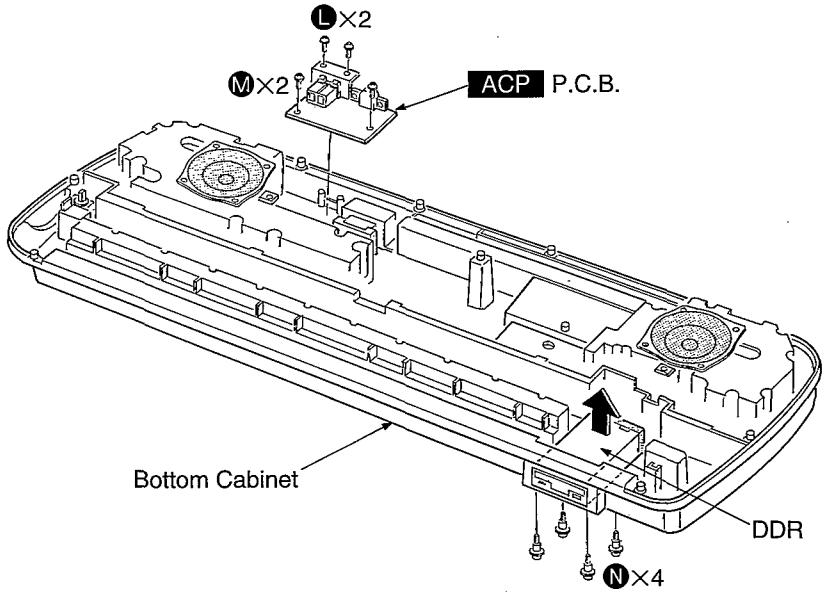
• Open the cabinet (see step 1).

ACP P.C.B.

• Remove the ACP P.C.B. mounting screws (L 2 pcs. and M 2pcs.).

4 Removing the digital disk recorder (DDR)

1. Open the cabinet (see step 1).
2. Remove the DDR mounting screws (N 4 pcs.).



[Fig. 3]

5 Removing the BEND, MKB1, MKB2 and MKB3 printed circuit boards

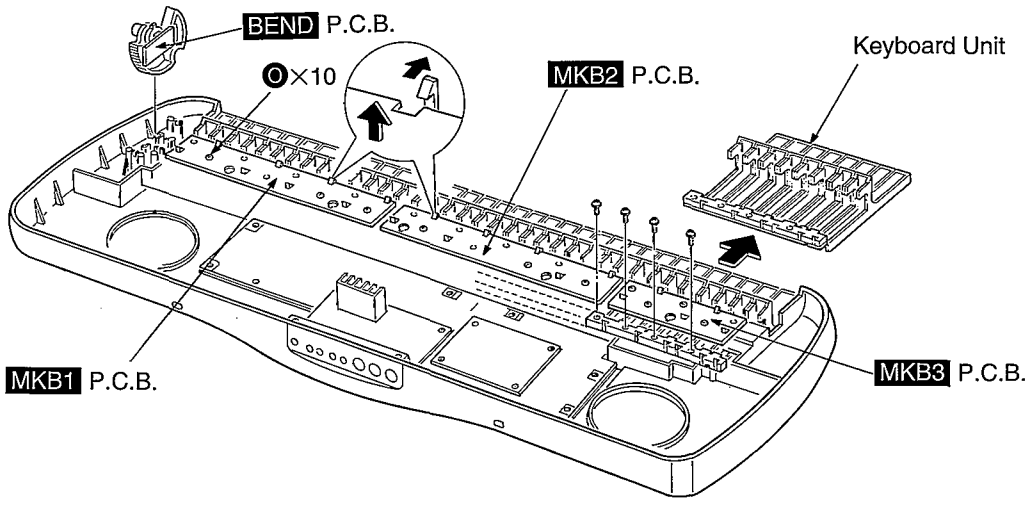
• Open the cabinet (see step 1).

BEND P.C.B. Ass'y

• Pull out the BEND P.C.B. ass'y from the cabinet.

MKB1, MKB2, MKB3 P.C.B.

• Remove the MKB1, MKB2 and MKB3 P.C.B. mounting screws (O 10pcs.).



[Fig. 4]

SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE

The following changes in performance may occur in the Technics Keyboard but do not indicate trouble.

	Phenomenon	Remedy
Sounds and effects	The buttons, keys, etc. malfunction.	• Turn off the **POWER** button once, then turn it on again. If this procedure is not successful, turn off the **POWER** button once. Then, while pressing the **0**, **1** and **2** buttons in the **RHYTHM SELECT/MODE SET** section at the same time, turn the **POWER** button on again. (Note that, in this case, all programmable settings, functions and memories return to their factory-preset status.)
	No sound is produced when the keys are pressed.	• The **MAIN VOLUME** is at the minimum setting. Adjust the volume with the **MAIN VOLUME** control. • The volumes for the selected parts are set to the minimum levels. Use the balance buttons to set the volumes of the relevant parts to appropriate levels. • The LOCAL CONTROL for a part performed on the keyboard is set to OFF. Set the LOCAL CONTROL to ON.
	The type of effect does not alternate when the **CHORUS/FLANGER** button is pressed.	• Follow the procedure to select the type of effect.
	The volume is very low when the keyboard is played.	• The volume setting in the **SEQUENCER** contents is very low. Follow the INITIAL procedure to reset the settings.
	Some sounds cannot be selected.	• When the GENERAL MIDI status is set to on, The sounds which can be selected and operation which can be executed are limited. Turn the GENERAL MIDI status off to return the instrument to its normal operation.
	The sound you hear is different from the sound you selected.	• This sometimes occurs when you play back **SEQUENCER** or **COMPOSER** data which was created on a different model, or when MIDI data is received from a connected instrument. Select the desired sounds again.
Rhythm	The rhythm does not start.	• The **DRUMS** volume is set to the minimum level. Use the balance buttons to set the **DRUMS** volume to an appropriate level. • In the **RHYTHM SELECT** section, a rhythm in **MEMORY A** or **MEMORY B** with no stored pattern was selected. Select a different rhythm. • A **SEQUENCER** track button is on. When you are not playing back the **SEQUENCER** performance, turn off the track buttons. • CLOCK is set to MIDI [MID]. Set CLOCK to INTERNAL [INT]. • The rhythm does not work when the GENERAL MIDI mode is set to ON. Turn the GENERAL MIDI status off to return the instrument to its normal operation.

	Phenomenon	Remedy
SEQUENCER	Storage is not possible.	• The remaining memory capacity of the **SEQUENCER** is 0. Follow the SEQUENCER CLEAR procedure to erase the memory.
	Multi-track storage is not possible.	• The playback track has been selected, but the **START/STOP** button has not been pressed. A flashing track indicator shows the track which is ready for recording, and a lit track indicator shows a track which is ready for playback. To record one track while listening to another (playback) track, press the **START/STOP** button to begin playback.
	The playback measure indication is different from when the performance was recorded.	• The number of measures corresponds to the time signature of the rhythm selected at the start of recording. To change the rhythm in the middle of the song, record the rhythm change in the RHYTHM part.
AUTO PLAY CHORD	No sound is produced for the automatic accompaniment.	• In the **RHYTHM SELECT** section, a rhythm in **MEMORY A** or **MEMORY B** with no stored pattern was selected. Select a different rhythm.
	No sound is produced for the automatic accompaniment, or only the sounds of some parts are produced.	• An **ACCOMP** part does not sound if its corresponding volume is set to the minimum level. Use the respective balance buttons to set the **ACCOMP 1**, **2** and **3** volumes to appropriate levels. • The part is muted.
COMPOSER	Storage is not possible.	• The remaining memory capacity of the **COMPOSER** is 0.
	Setting the time signature and number of measures is not possible.	• The time signature and number of measures cannot be changed for a pattern which is currently recorded in the **COMPOSER**. If you wish to change the time signature and/or measure data, first follow the procedure to clear the memory.
	The playback timing of the rhythm pattern is different from the timing with which it was recorded.	• The QUANTIZE function was on when the pattern was recorded and the timing was automatically corrected. Set the quantize level to a smaller note unit or to OFF when recording.
Disk Drive	The Disk Drive produces a noise during recording or playback.	• This occurs when the Disk Drive is reading a disk. It does not indicate a problem.
	When the procedure to load from a disk is performed, the contents of the keyboard memory are erased.	• When performing the load operation from a disk, the keyboard memory changes to that of the data loaded from the disk. If you wish to preserve a song which is stored in the keyboard memory, save it on a disk before performing the load procedure.
Other	Noise from a radio or TV can be heard.	• This sometimes occurs when electrical equipment such as a radio or TV is used near the instrument. Try moving such electrical equipment further away from the instrument. • The sound may be coming from a nearby broadcast station or amateur radio station. If the sound is bothersome, consult your dealer or service center.
	The cabinet becomes warm during use.	• This instrument has a built-in power source that heats the cabinet to some degree. This is not an indication of trouble.

ERROR DISPLAY

No.	Contents
00	The data on the disk that you are using is for a different product.
01	An error has occurred while the disk was loading. Please try again!
02	There is no disk in the Disk Drive.
03	The file that you tried to load is empty.
05	An error has occurred while the disk was saving. Please try again!
06	The disk that you are using is write protected. Please remove the write protection and try again.
07	The disk that you are using is full. Please use another disk.
08	An error has occurred while the disk was formatting. The disk that you are using may be faulty. Please try formatting another disk.
09	The data on the disk is copy protected.
10	The data is already copy protected.
20	A problem has occurred with your **SEQUENCER** Data. This might be due to a damaged or faulty disk.
21	Memory full
23	It is impossible to change the time signature because it has already been set in the existing tracks.
24	A rhythm track already exists. It is impossible to assign two tracks to rhythm.
28	This song is too long to be saved as a MIDI file.
29	The MIDI file that you have tried to load exceeds the memory capacity of this instrument and cannot be played. The **SEQUENCER** memory has been cleared.

No.	Contents
30	It is not possible to change the time signature or measure length of a **COMPOSER** pattern after it has been recorded. If you want to proceed, you must first clear the entire **COMPOSER** pattern.
31	The time signature of the pattern from which you are copying is different from the **COMPOSER** memory that you are using. Either: Change the time signature of the **COMPOSER** memory or: Copy from a pattern that has the same time signature
32	Memory full
40	The Identification (ID) code of the system exclusive data received by this instrument is for a different product.
41	An error has occurred during system exclusive data reception. The data from the transmitting device may be incomplete. Please try again.
42	An error has occurred during system exclusive transmission. The data has not been received correctly. Please try again.
43	The file that you are trying to load was saved on a previous KN Keyboard. It is only possible to load using the "ALL" option.
44	It is impossible to edit a KEYBOARD PERCUSSION. Please select a different sound from any group except Keyboard Percussion.
45	Incompatible disk format.
47	Please select a preset pattern (**00–99**).
54	Please select a user bank (10-12).

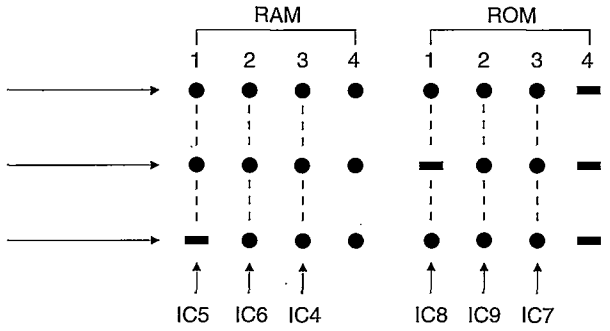
ABOUT THE SELF-DIAGNOSTIC FUNCTION

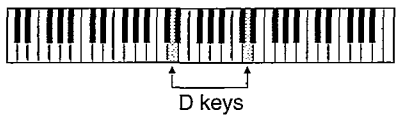
This model has some self-diagnostic capabilities. When set to the self-diagnostic mode, operation of various components can be verified by following the procedures in the chart below.

<table>
<tr><th>No.</th><th>PCB</th><th>TEST MODE</th><th>Procedure</th></tr>
<tr><td>1</td><td>MAIN</td><td>RAM (IC4-6), ROM (IC7-9) check</td><td>1. Connect the CHECKING DEVICE (refer to page I-14) to CN 1 on the MAIN P.C.B., and turn on the CHECKING DEVICE switch.
2. Turn on the power switch.</td></tr>
<tr><td></td><td></td><td colspan="2">When the power switch is turned on, the LED of the CHECKING DEVICE flashes 8 times. The first 4 flashes are for the RAM check, and the latter 4 flashes are for the ROM check. The order of the LED flashes correspond to the respective IC numbers as shown below. If an IC is defective, the corresponding flash time is longer.

Examples
1. RAM OK, ROM OK
2. RAM OK, ROM (IC8) defective
3. RAM (IC5) defective, ROM OK

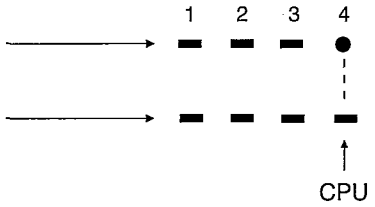
NOTE : ● indicates short flash time
▬ indicates long flash time

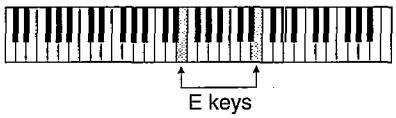
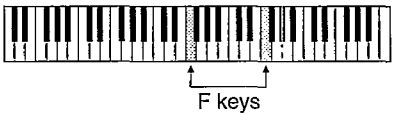
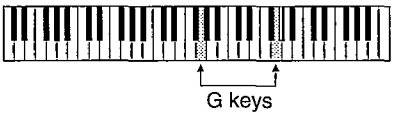
 
</td></tr>
<tr><td>2</td><td>CP1</td><td>Control panel CPU check</td><td>1. Connect the CHECKING DEVICE to CN 1 on the MAIN P.C.B. (The Checking Device switch should be off).
2. Press and hold the two D keys shown below, and then turn on the power switch.

 
</td></tr>
<tr><td></td><td></td><td colspan="2">When the power switch is turned on, the LED of the CHECKING DEVICE flashes 4 times. The order of the LED flashes corresponds to the CPU (IC) on the respective P.C.B..s as shown below. If an IC is defective, the corresponding flash time is longer.

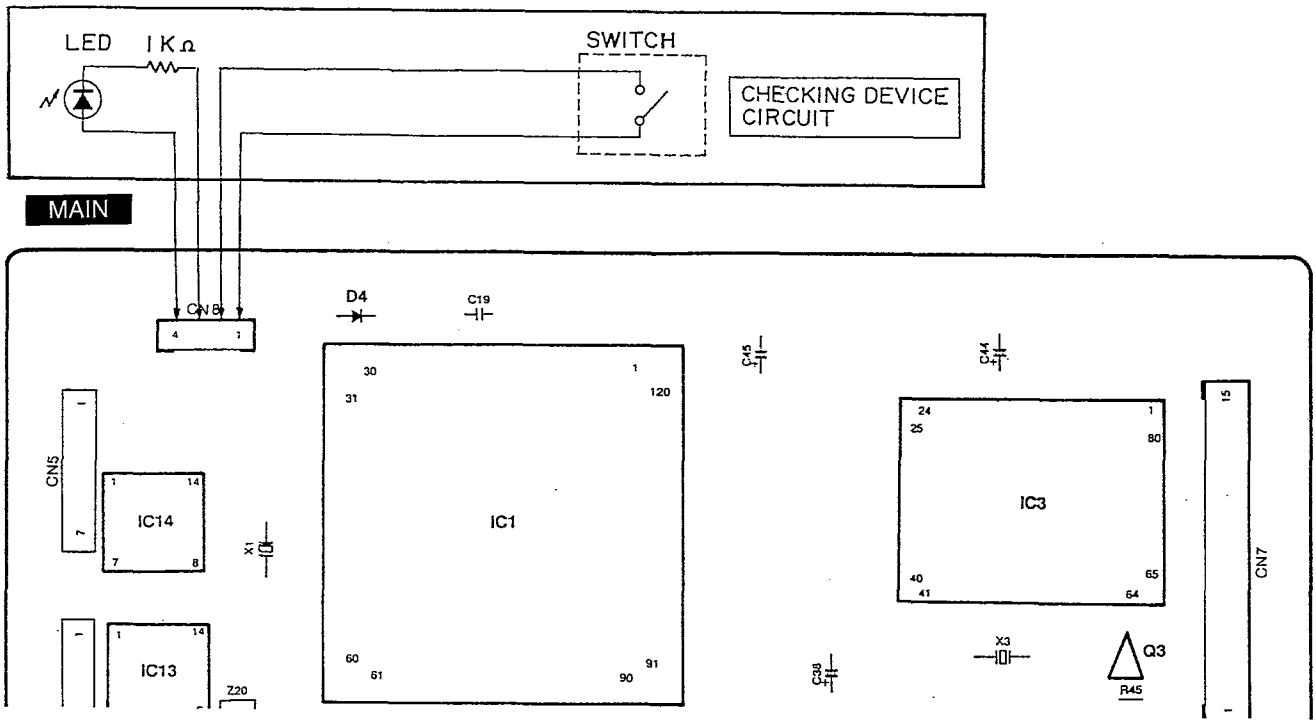
1. OK
2. CPU defective

NOTE : ● indicates short flash time
▬ indicates long flash time

 
</td></tr>
</table>

<table>
<tr><th>No.</th><th>PCB</th><th>TEST MODE</th><th>Procedure</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">MAIN</td><td>Wave ROM check
MAIN: IC11, 12</td><td>Press and hold the two E keys shown below, and then turn on the power switch.
 
E keys</td></tr>
<tr><td>When set to the self-diagnostic mode, the Wave ROM outputs a sine wave. The Wave ROMs correspond to the keyboard keys as shown in the diagram to the right. When a key is pressed, the corresponding sine wave sound is produced. If no sound is produced, or if the sound is distorted, the Wave ROM corresponding to that key is defective.</td><td>• The key number indicates the Wave ROM number. (1:IC11, 2:IC12)
<table><tr><td>KEY</td><td>C</td><td>C#</td><td>D</td><td>D#</td><td>E</td><td>F</td><td>F#</td><td>G</td><td>A</td><td>A#</td><td>B</td></tr><tr><td></td><td>1</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr></table></td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">CP1
CP2
CP3</td><td>LED & SW check</td><td>Press and hold the two F keys shown below, and then turn on the power switch.
 
F keys</td></tr>
<tr><td colspan="2">All the LEDs turn off after lighting once. Confirm that all the LEDs light.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">LCD</td><td>LCD Display check</td><td>Press and hold the two G keys shown below, and then turn on the power switch.
 
G keys</td></tr>
<tr><td colspan="2">All dots of the LCD screen light for 10 seconds, after which different displays appear in succession.</td></tr>
</table>

■ Connection between serving CHECKING DEVICE and MAIN P.C.B.



MIDI IMPLEMENTATION CHART

Keyboard [SX-KN901] **(Transmitted)**

Function		RIGHT1,2,LEFT, PART4~15	PART16	ACMP1	ACMP2,3	BASS	DRUMS	CHORD	CONTROL	Remarks
Basic Channel	Default	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	memorized
	Changed	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	
Mode	Default	3	3	3	3	3	3	3	3	OMNI OFF,POLY MODE
	Messages	×	×	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	—	—	
Note Number		0-119	0-119	0-119	0-119	0-119	0-119	0-119	—	Changes depending on the position of the transpose control,octave shift,and drums type.
	True voice	—	—	—	—	—	—	—	—	
Velocity	Note ON	○	○	○	○	○	○	○	—	
	Note OFF	×	×	×	×	×	×	×	—	
After Touch	Key's	×	×	×	×	×	×	×	—	
	Ch's	×	×	×	×	×	×	×	—	
Pitch Bend		○×*	×	○×*	○×*	○×*	×	○×*	×	
Control Change	0,32	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	bank select MSB, LSB
	1	○×*	×	○×*	○×*	○×*	×	○×*	×	modulation
	6,38	○×*	×	×	×	×	×	×	×	data entry MSB, LSB
	7	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	volume
	10	○×*	×	×	×	×	×	×	×	panpot
	11	○×*	○×*	×	×	×	×	×	○×*	expression
	64	○×*	○×*	○×*	○×*	○×*	○×*	×	×	sustain
	80	×	×	○×*	×	×	×	×	×	auto play chord
	82	×	×	×	×	×	○×*	×	×	intro, fill in, ending
	91	○×*	○×*	○×*	○×*	○×*	○×*	○×*	○×*	reverb
	93	○×*	○×*	×	×	×	×	○×*	×	chorus
	94	○×*	×	○×*	○×*	○×*	×	○×*	×	digital effect
	100,101	○×*	×	×	×	×	×	×	×	RPN LSB, MSB
	120	○	○	×	×	×	×	×	×	all sound off
	121	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	reset all cotrollers
Prog Change		○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	Changes depending on program change mode and prog.cng to p.mem.
	True #	—	—	—	—	—	—	—	—	
System exclusive		○								
System common	Song Pos	○×*								
	Song Sel	○×* (0-19)								
	Tune	×								
System Real Time	Clock	○								
	Commands	○×*								start/stop,continue
Aux Messages	Local ON/ OFF	×	×	×	×	×	×	×	—	
	All notes OFF	×	×	×	×	×	×	×	—	
	Active Sense	○								
	Reset	×								
Notes		○×*.....Whether or not the data for each of these items is transmitted can be set.								

Mode 1: OMNI ON, POLY Mode 2: OMNI ON, MONO ○:Yes

Mode 3: OMNI OFF, POLY Mode 4: OMNI OFF, MONO ×:No

Keyboard [SX-KN901] (Recognized)

Function		RIGHT1,2,LEFT, PART4～15	PART16	ACMP1	ACMP2,3	BASS	DRUMS	CHORD	CONTROL	Remarks
Basic Channel	Default	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	memorized
	Changed	1-16	1-16	1-16	1-16	1-16	1-16	1-16	1-16	
Mode	Default	3	3	3	3	3	3	3	3	OMNI OFF,POLY MODE
	Messages	×	×	×	×	×	×	×	×	
	Altered	–	–	–	–	–	–	–	–	
Note Number		0-127	0-127	0-127	0-127	0-127	0-127	0-127	–	Changes depending on the position of the transpose control,octave shift, and drums type.
	True voice	0-127	0-127	0-127	0-127	0-127	0-127	0-127	–	
Velocity	Note ON	○	○	○	○	○	○	○	–	
	Note OFF	×	×	×	×	×	×	×	–	
After Touch	Key's	×	×	×	×	×	×	×	–	
	Ch's	×	×	×	×	×	×	×	–	
Pitch Bend		○×*	×	○×*	○×*	○×*	×	○×*	×	
Control Change	0,32	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	bank select MSB, LSB
	1	○×*	×	○×*	○×*	○×*	×	○×*	×	modulation
	6,38	○×*	×	×	×	×	×	×	×	data entry MSB, LSB
	7	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	volume
	10	○×*	×	×	×	×	×	×	×	panpot
	11	○×*	○×*	×	×	×	×	×	○×*	expression
	64	○×*	○×*	○×*	○×*	○×*	○×*	×	×	sustain
	80	×	×	○×*	×	×	×	×	×	auto play chord
	82	×	×	×	×	×	○×*	×	×	intro, fill in, ending
	91	○×*	○×*	○×*	○×*	○×*	○×*	○×*	○×*	reverb
	93	○×*	○×*	×	×	×	×	○×*	×	chorus
	94	○×*	×	○×*	○×*	○×*	×	○×*	×	digital effect
	100,101	○×*	×	×	×	×	×	×	×	RPN LSB, MSB
	120	○	○	○	○	○	○	○	×	all sound off
	121	○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	reset all cotrollers
Prog Change		○×*	○×*	○×*	○×*	○×*	○×*	○×*	×	Changes depending on program change mode and prog.cng to p.mem.
	True #	0-127	0-127	0-127	0-127	0-127	0-127	0-127	–	
System exclusive		○								
System common	Song Pos	○×*								
	Song Sel	○×* (0-19)								
	Tune	×								
System Real Time	Clock	○								
	Commands	○×*								start/stop,continue
Aux Messages	Local ON/ OFF	×	×	×	×	×	×	×	–	
	All notes OFF	○	○	○	○	○	○	○	–	
	Active Sense	○								
	Reset	×								
Notes		○×*……Whether or not the data for each of these items is received can be set.								

Mode 1: OMNI ON, POLY Mode 2: OMNI ON, MONO ○:Yes

Mode 3: OMNI OFF, POLY Mode 4: OMNI OFF, MONO ×:No

PRECAUTIONS BEFORE SERVICING

■ Precautions for measuring of the output waveforms.

1. The waveform was measured with a "National Digital Storage Oscilloscope VP-5730A". Therefore the waveforms of musical tone signals shown may differ somewhat due to the difference in the timing of triggering.
2. Since the 1/10 test probe is used, the indicated voltage value on the bottom part of each waveform photo is 1/10 of the actual value (e.g. 0.2 V/cm should be 2.0 V/cm).
3. To measure the waveforms, first set this unit to the self-diagnostic mode (refer to page I-14, No. 3). The Wave ROM output will then be output as a sine wave to facilitate the servicing check.

■ Important safety notice:

Components identified by a ⚠ mark have special characteristics impotant for safety.
When replacing any of these components, use only manufacture's specified parts.

■ Symbolic Marks

The symbolic marks for resistors and capacitors which used in this circuits are classified as following TABLE-1 and TABLE-2.

1. RESISTORS
   - Resistors without symbolic mark are FIXED CARBON FILM RESISTORS (ERD-type).
   - All resistors are 1/4 WATT, ±5 % TOLERANCE unless otherwise designated in schematic diagrams.

(TABLE-1)

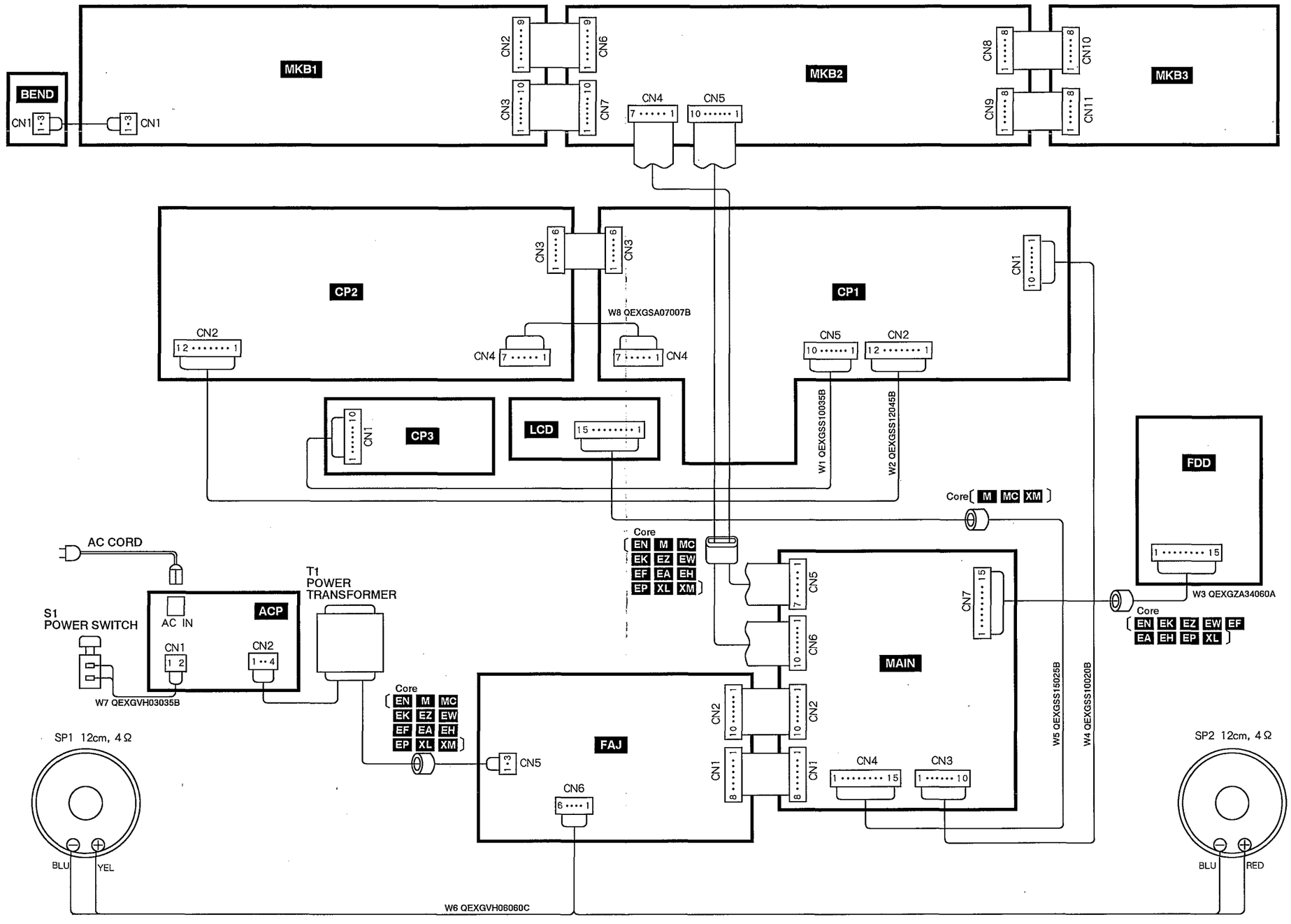
SYMBOL	SPECIFICATION	SYMBOL	SPECIFICATION
Ⓕ	Fixed Carbon Film Resistors "FLAME-PROOF" (ERD—F—type)	Ⓕ	Fixed Metal Film Resistors "FLAME-PROOF" (ERX—type)
Ⓕ	Fixed Wire Wound Resistors "FLAME-PROOF" (ERF—type)	[F]	Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERQ—type)
Ⓕ	Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERG—type)	[F]	Fuse Type Fixed Carbon File Resistors "FLAME-PROOF" (ERD2FC—type)
Ⓖ	Fixed Metal Film Resistors (Precision and High Stability) (ERO—type)		

2. CAPACITORS
   - Capacitors without symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type, ±10 % Tolerance)
   - Polarized capacitors without symbolic mark are Aluminum Electrolytic Capapcitors. (ECEA-type, ±20 % Tolerance)

(TABLE-2)

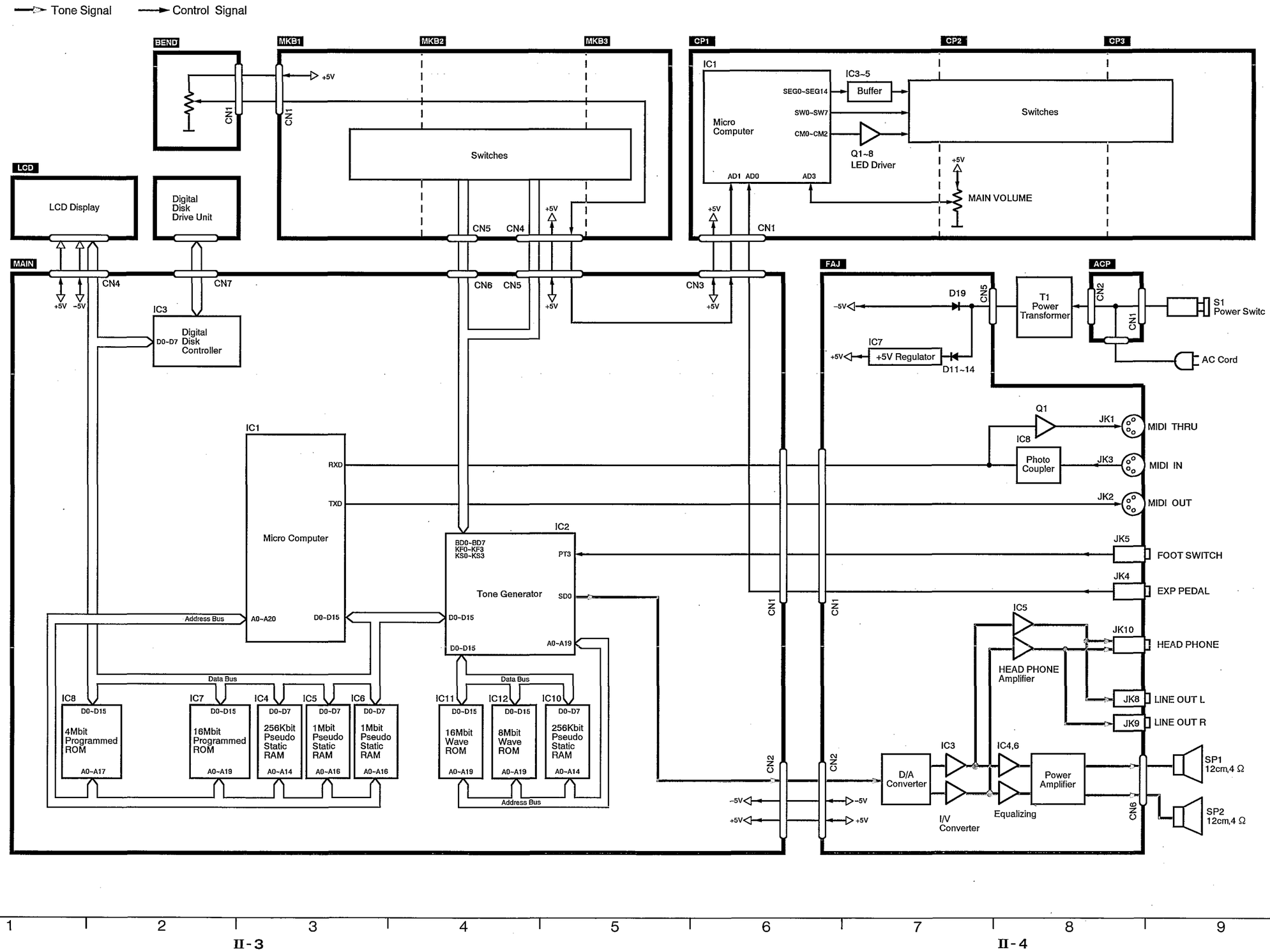
SYMBOL	SPECIFICATION	TYPE
Ⓝ	Non-Polarized Electrolytic Capacitors	ECEA_KN_type
Ⓨ	Non-Polarized Electrolytic (for Network system)	ECEA_Y_type
Ⓣ	Tantalum Solid Electrolytic Capacitors	ECS_type
TF	Metalized Plastic Film Capacitors (TF Series)	ECQV_type
○	Temperature Compensating Ceramic Capacitors	ECC_type
	High-Dielectric Constant Ceramic Capacitors	ECK_type ECR_type
	Axial Lead Ceramic Capacitors	ECB_type
	Metalized Polyester Film Capacitors for Across the Line	ECQ_EW_type
	Aluminum Electrolytic Capacitors for Smoothing Circuit	ECES_type
	Multilayer Ceramic Chip Capacitors	ECUV_type

WIRING CONNECTION Diagram



II-1 II-2

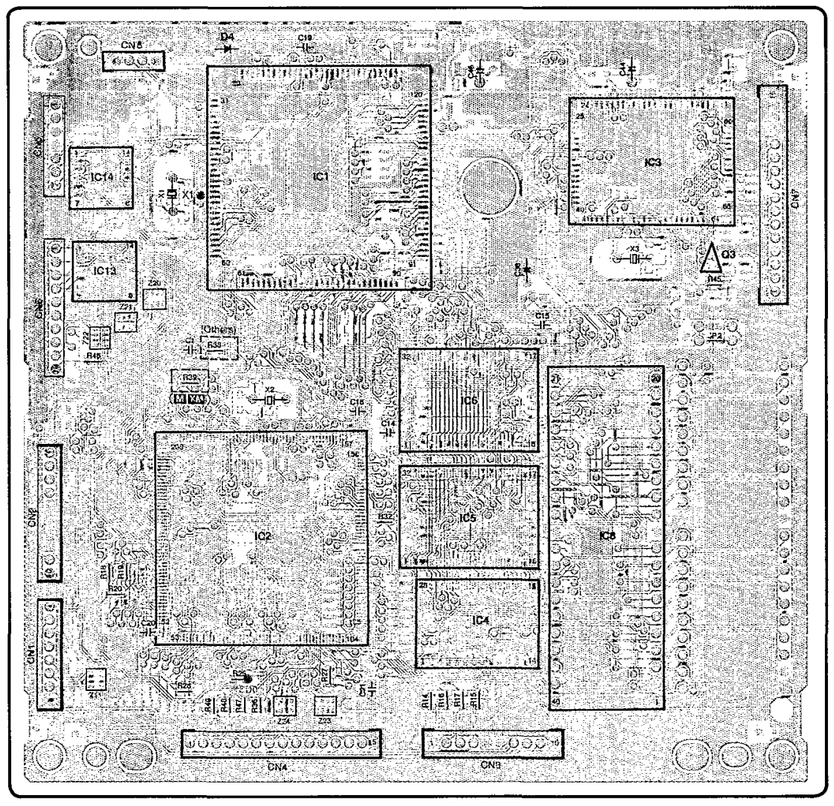
BLOCK Diagram



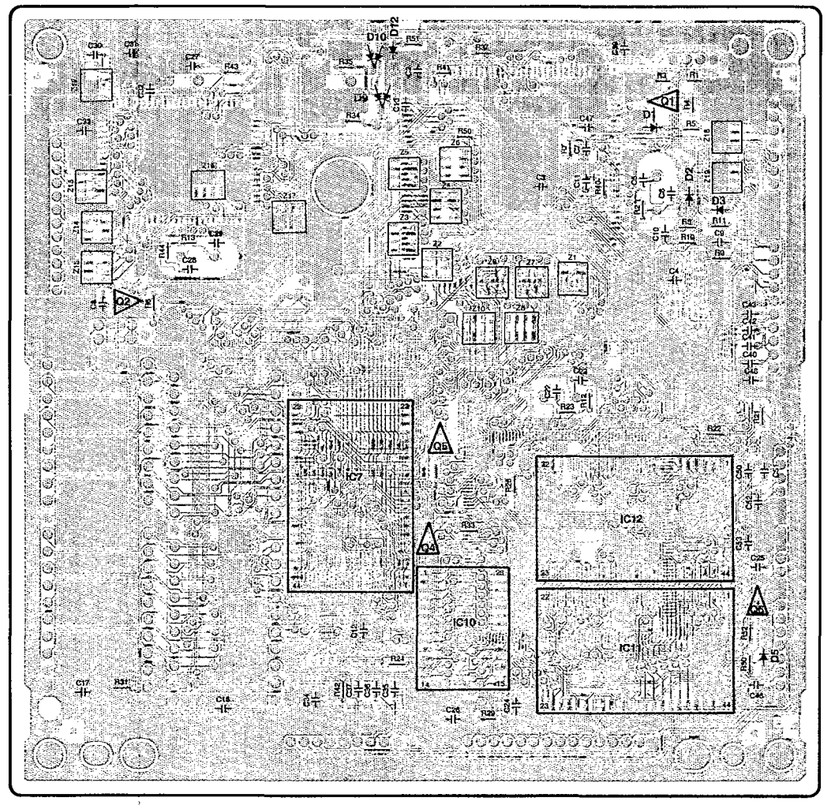
MAIN P.C. Board

Others (SXPG223511)

MAIN M XM (SXPG223521) (COMPONENT SIDE)



MAIN (FOIL SIDE)



MAIN

NOTES:

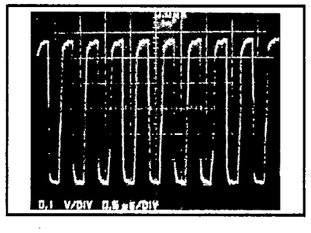
- IC'S
  - IC1: D70236AGD10
  - IC2: D94137GD-201
  - IC3: D72068GF-3B9
  - IC4: M5256BFP85LL
  - IC5: T518129CFWL8
  - IC6: T518129CFWL8
  - IC7: QSIGU3C16362
  - IC8: QSIGCK901AX
  - IC8-1: [M27C400210F1]
  - IC10: TC51832AFL70
  - IC11: QSIGU3C16853
  - IC12: QSIGU3C08312
  - IC13, 14: D74HC08GS
- TRANSISTORS
  - Q1: 2SB709AR
  - Q2~6: 2SD601AQ
- DIODES
  - D1: MA8030L
  - D2, 3: MA110
  - D4: MA2062LF
  - D5: MA8056
  - D9, 10: MA151WK
  - D12: MA110

■ Measuring Conditions

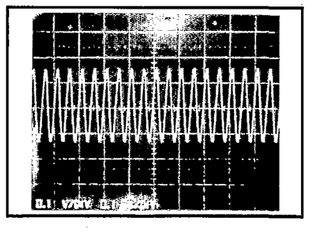
Set the initial setting mode (Refer to page I-3)

- KEYBOARD C4
- RHYTHM ..... Start
- TEMPO ..... ♩ =120

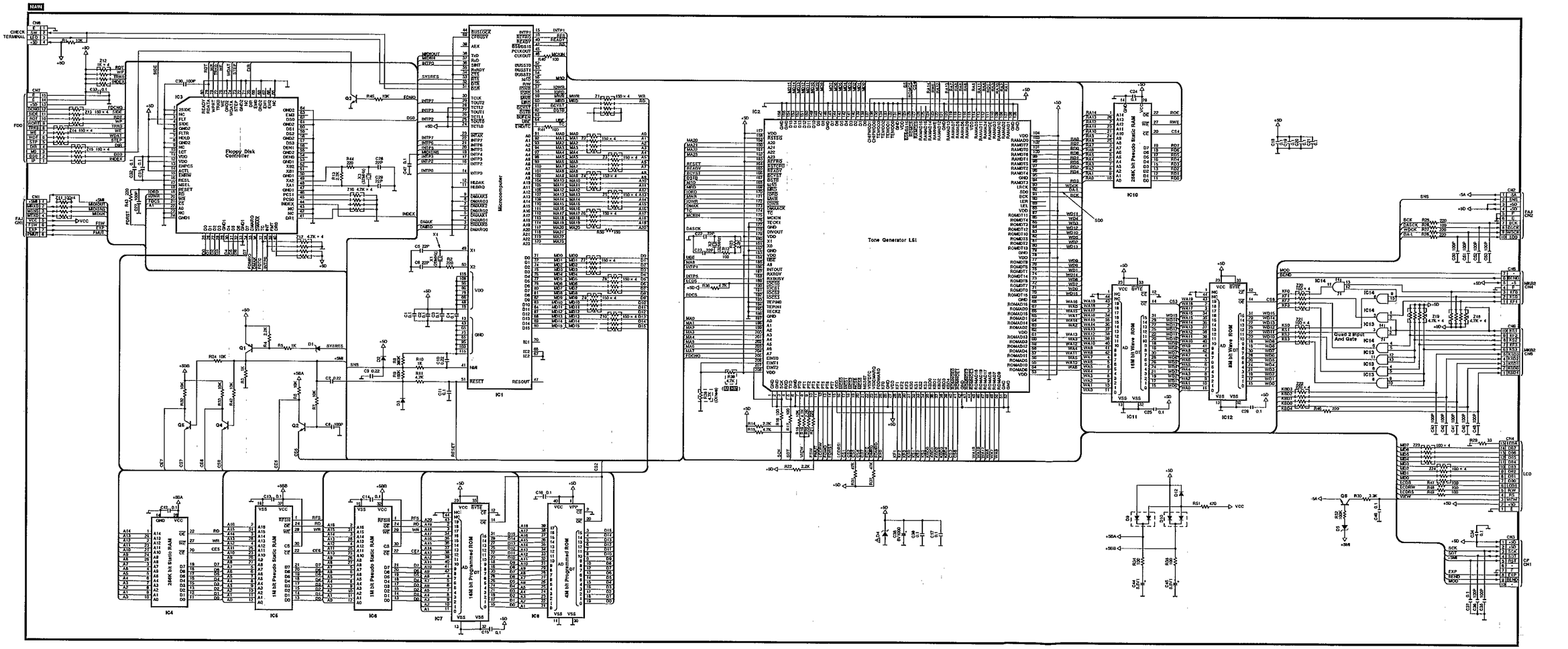
SDO



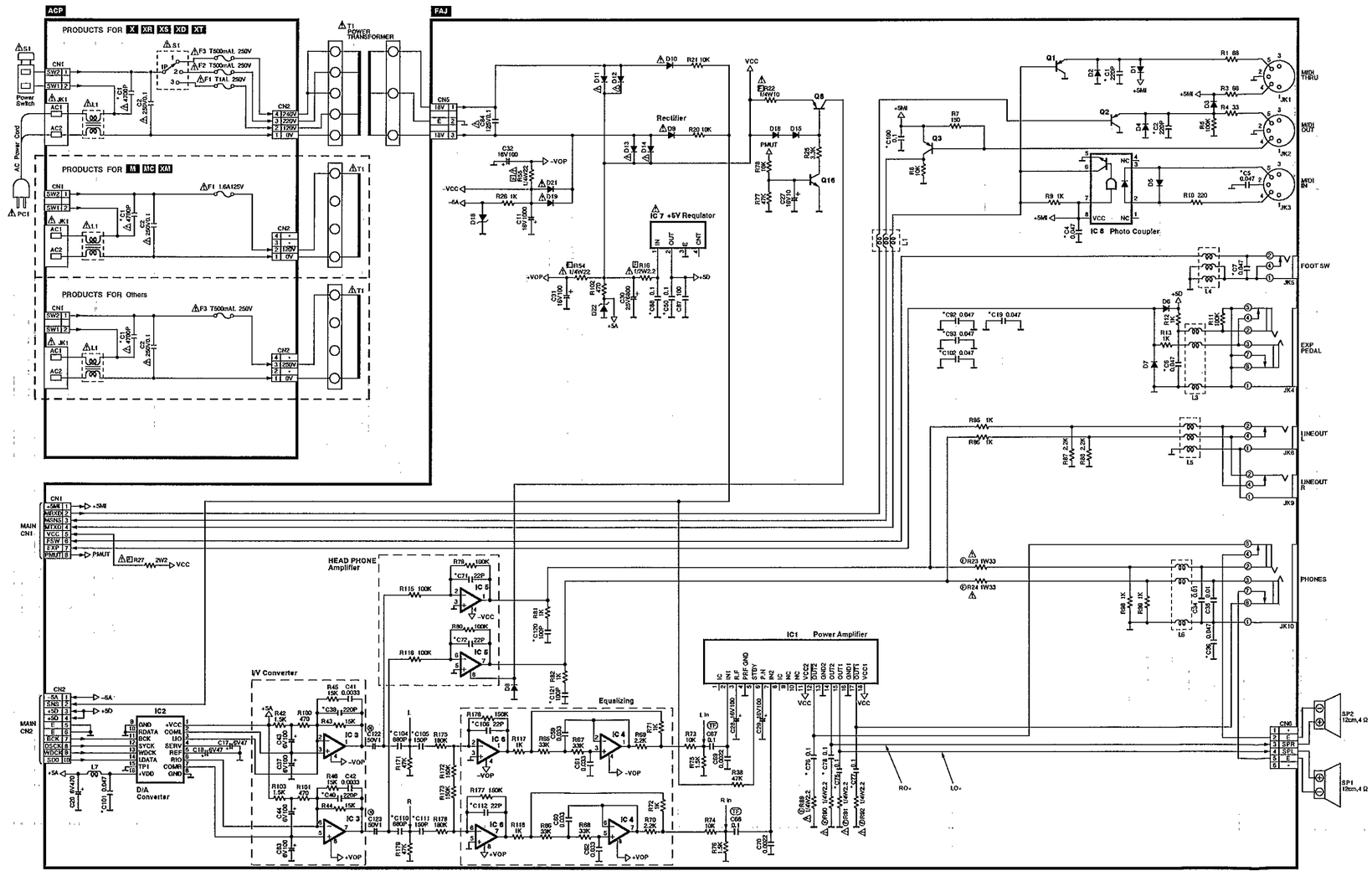
X1



MAIN P.C. Diagram



FAJ/ACP P.C. Diagram

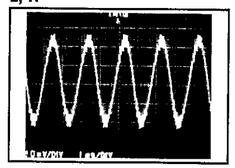


■ Measuring Conditions

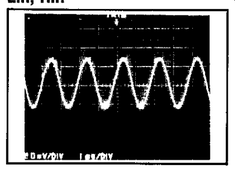
Set to the self-diagnostic mode followings.

- While pressing two E keys simultaneously, turn on the power switch.
- SOUND/VARIATION SELECT ..... 5 (10 dB Down)
- MAIN VOLUME..... Center
- KEYBOARD C4

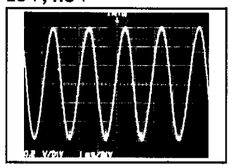
L, R



Lin, Rin

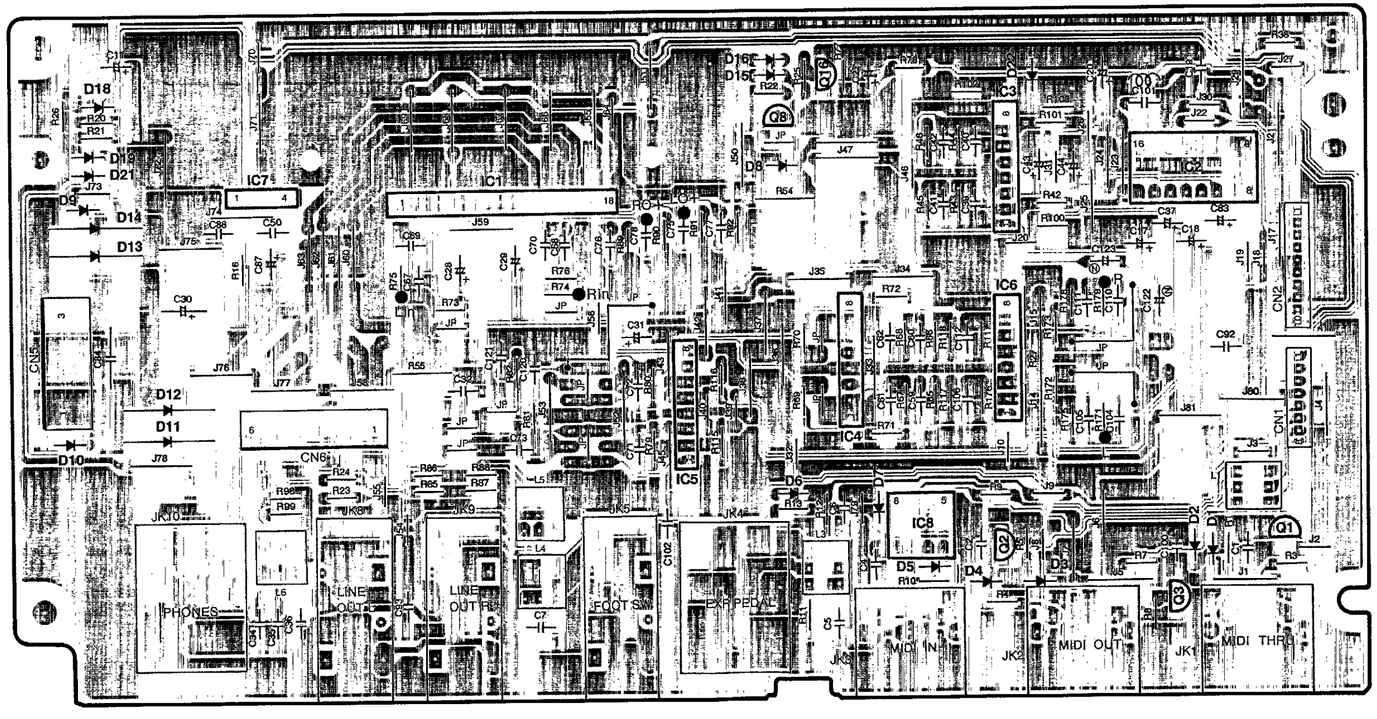


LO+, RO+



FAJ/ACP P.C. Board

FAJ (SXPG223611)



FAJ

NOTES:

- IC'S

IC1:	LA4705
IC2:	PCM69AP
IC3, 4:	M5218AL
IC5:	SVIGM5216LL
IC6:	M5218AL
IC7:	PQ05RF2
IC8:	QCPL-260L

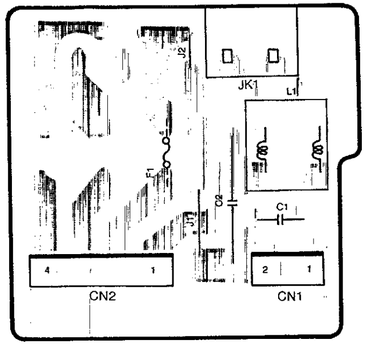
- TRANSISTORS

Q1~3:	2SA1015-GR
Q8:	2SA1534AR
Q16:	2SC1815GR

- DIODES

D1~7:	MA165
D8:	EK04
D9, 10:	SVDGERA1502
D11~14;	SVDS3V20
D15, 16:	MA165
D18:	MA4501
D19, 21:	SVDGERA1502
D22:	MA4051

ACP M MC XM (SXPG224721)



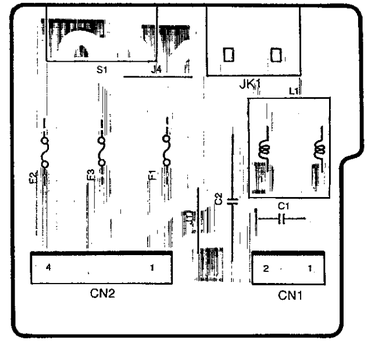
ACP

NOTE:

- FUSE

F1: XBA1C16NU100

ACP X XR XS XD XT (SXPG224731)



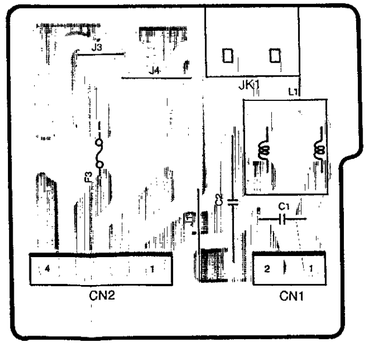
ACP

NOTE:

- FUSES

F1: XBA2C10TB0
F2, 3: XBA2C05TB0

ACP Others (SXPG224711)



ACP

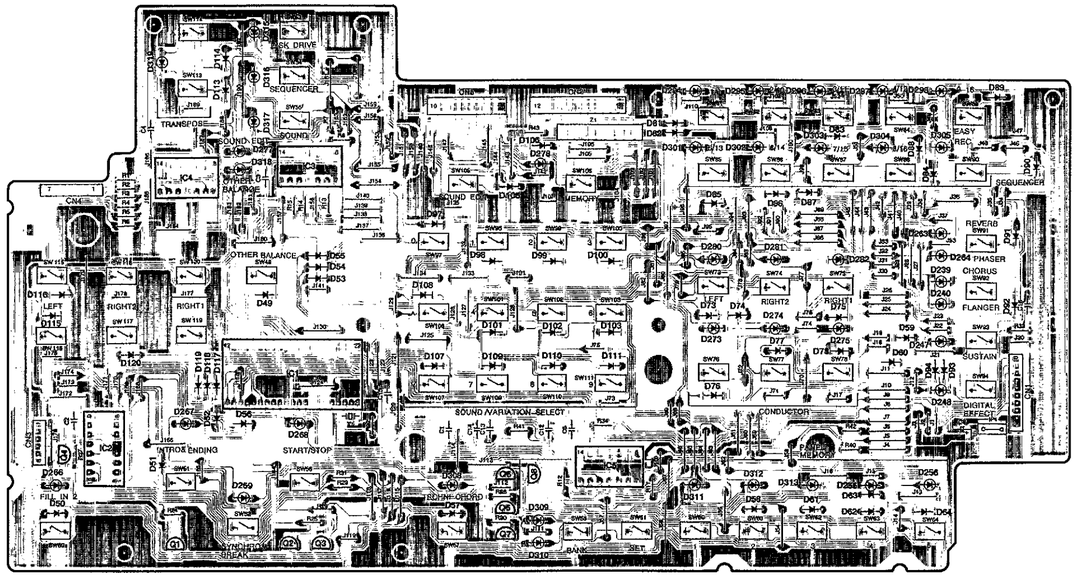
NOTE:

- FUSE

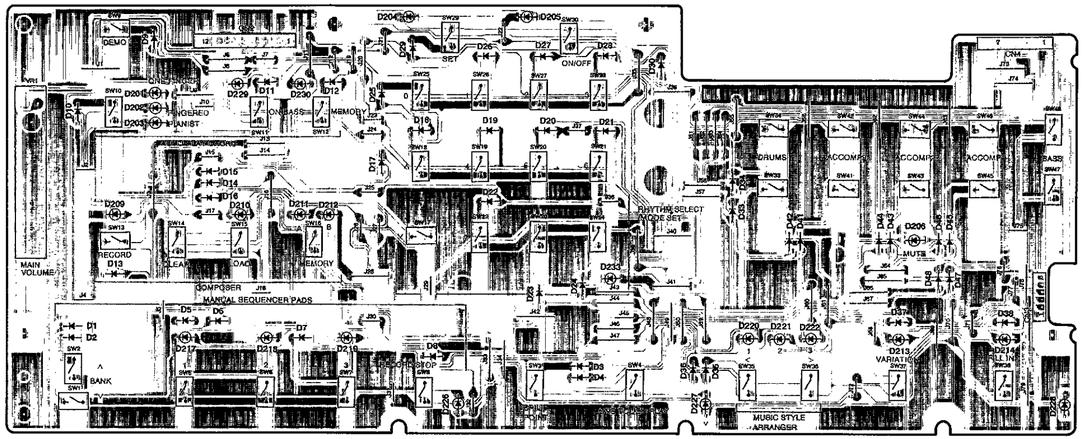
F3: XBA2C05TB0

CP1/CP2/CP3 P.C. Board

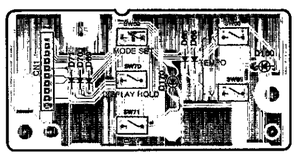
CP1 (SXPG223711A)



CP2 (SXPG223711B)



CP3 (SXPG223711C)



CP1

NOTES:

- IC'S
  - IC1: M37471M2196S
  - IC2: HD74LS138P
  - IC3~5: HD74LS07P
- TRANSISTORS
  - Q1~8: 2SA830SB
- DIODES
  - D49~64, 73~78, 81~94, 97~103, 105~111, 113~120: MA165
  - D239, 240, 247, 248, 263, 264, 266~269, 273~275, 280~282, 308, 318: LN282R
  - D255, 256, 277, 278, 294~298, 301~305, 309~313, 315~317, 319: LN382G

CP2

NOTE:

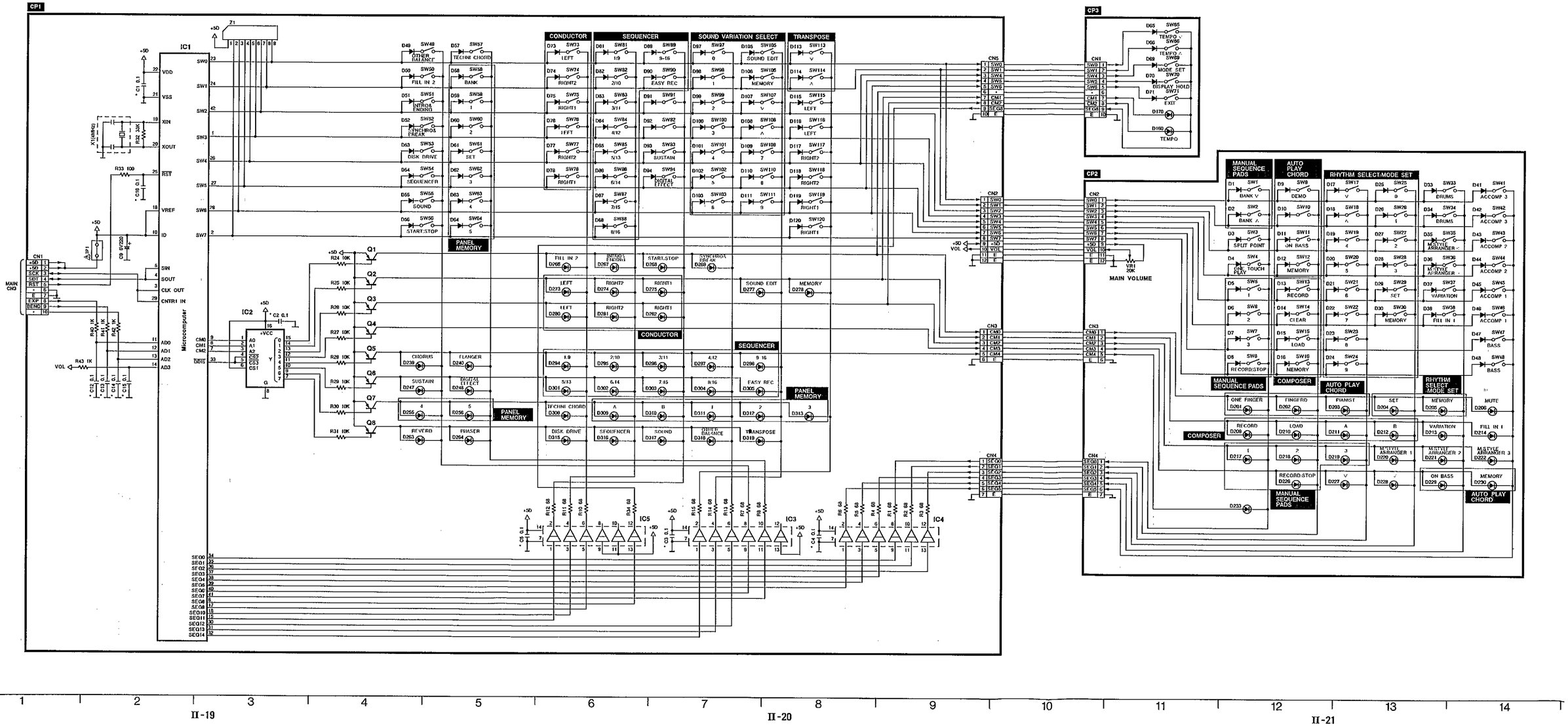
- DIODES
  - D1~30, 33~38, 41~48: MA165
  - D201~203, 206, 213, 214, 220~222, 226~230: LN282R
  - D204, 205, 209~212, 217~219, 233: LN382G

CP3

NOTE:

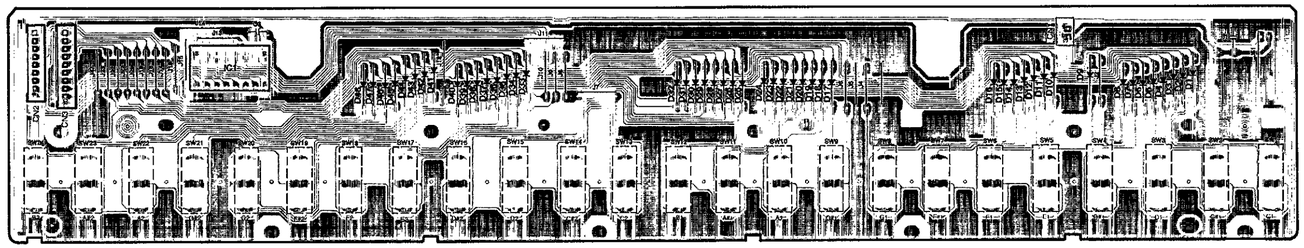
- DIODES
  - D65, 66, 69~71: MA165
  - D160: LN382G
  - D170: LN282R

CP1/CP2/CP3 P.C. Diagram

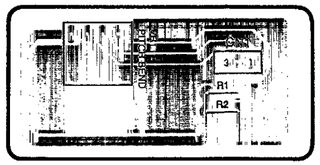


MKB1/MKB2/MKB3/BEND

MKB1 (SXPG224811A)



BEND (SXPG223711D)



MKB1

NOTES:

- IC
  - IC1: HD74LS138P
- DIODES
  - D1~48: MA165

MKB2

NOTES:

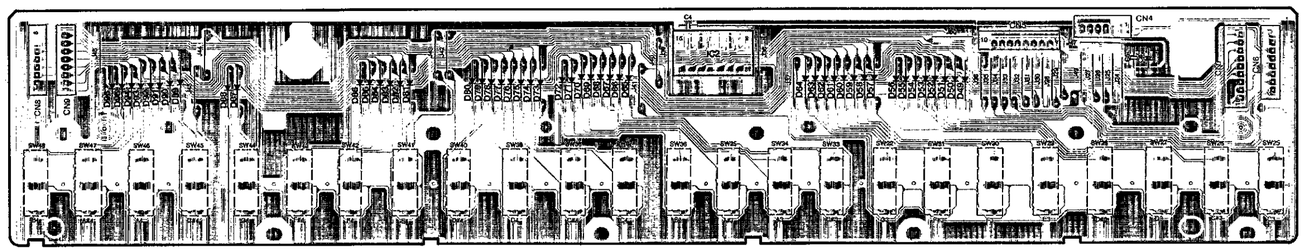
- IC
  - IC2: HD74LS138P
- DIODES
  - D49~96: MA165

MKB3

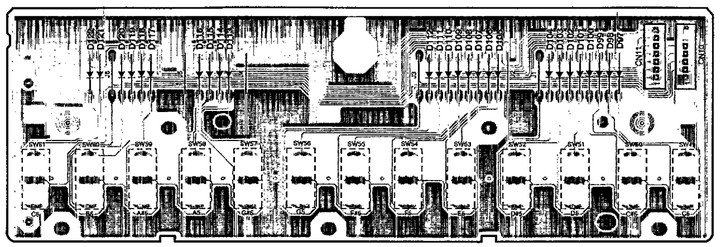
NOTE:

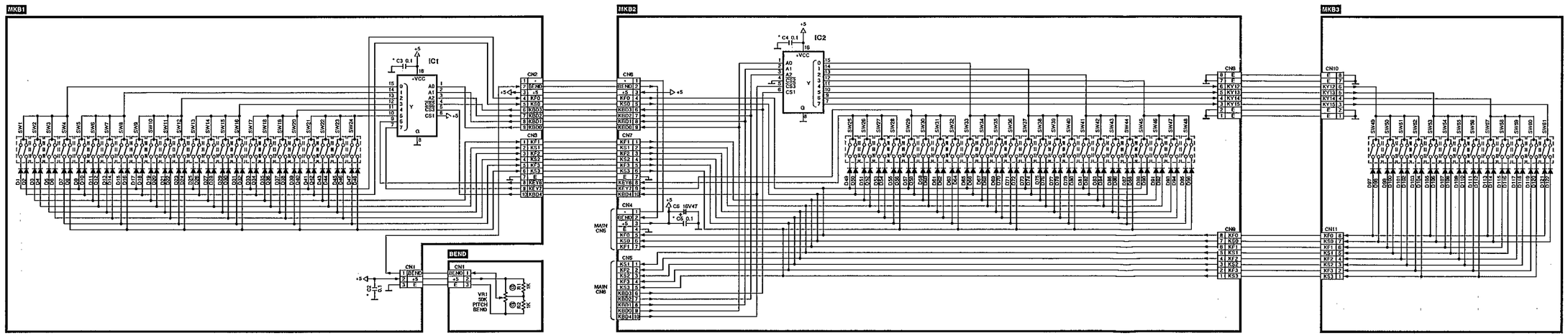
- DIODES
  - D97~122: MA165

MKB2 (SXPG224811B)



MKB3 (SXPG220011)





REPLACEMENT PARTS LIST.....P.C.B. and Wiring Parts

Notes:

1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retension period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.
4. ○ mark are new parts.
5. For part No. with area mark, check the area when placing an order.

■ PRINTED CIRCUIT BOARD

	RTL	Area	Part No.	Description	P/S
○	RTL	EN MC EK EZ EW EF EA EH EP X XL XR XS XD XT XP	SXPG223511	MAIN	1
○	RTL	M XM	SXPG223521	MAIN	1
○	RTL		SXPG223611	FAJ	1
○	RTL	EN EK EZ EW EF EA EH EP XL XP	SXPG224711	ACP	1
○	RTL	M MC XM	SXPG224721	ACP	1
○	RTL	X XR XS XD XT	SXPG224731	ACP	1
○	RTL		SXPG223711A	CP1	1
○	RTL		SXPG223711B	CP2	1
○	RTL		SXPG223711C	CP3	1
○	RTL		SXPG224811A	MKB1	1
○	RTL		SXPG224811B	MKB2	1
	RTL		SXPG220011	MKB3	1
○	RTL		SXPG223711D	BEND	1
			QSLG005BA	LCD	1

MAIN MAIN CIRCUIT

Ref. No.	Part No.	Description	P/S
INTEGRATED CIRCUITS			
IC1	D70236AGD10	Microcomputer	1
IC2	D94137GD-201	Tone Generator LSI	1
IC3	D72068GF-3B9	Floppy Disk Controller	1
IC4	M5256BFP85LL	256K bit Static RAM	1
○ IC5	T518129CFWL8	1M bit Pseudo Static RAM	1
○ IC6	T518129CFWL8	1M bit Pseudo Static RAM	1
○ IC7	QSIGU3C16362	16M bit Programmed ROM	1
○ IC8	QSIGCK901AX	4M bit Programmed EP ROM	1
S IC8-1	〔M27C400210F1	(Blank ROM)	1
IC10	TC51832AFL70	256K bit Static RAM	1
○ IC11	QSIGU3C16853	16M bit Wave ROM	1
○ IC12	QSIGU3C08312	8M bit Wave ROM	1
IC13, 14	D74HC08GS	Quad 2 Input And Gate	2
TRANSISTORS			
Q1	2SB709AR	Transistor	1
Q2~6	2SD601AQ	Transistor	5

Ref. No.	Part No.	Description	P/S
DIODES			
D1	MA8030L	Zener, 3.1V	1
D2, 3	MA110	Diode	2
D4 ⚠	MA2062LF	Zener, 6.2V	1
D5	MA8056	Zener, 5.6V	1
D9, 10	MA151WK	Diode	2
D12	MA110	Diode	1
OSCILLATORS			
X1	SVQGA20MX040	20MHz, Ceramic Oscillator	1
X2, 3	QSXG1I3200A	32MHz, Quartz Oscillator	2
COMPONENT COMBINATIONS			
Z1~10	EXBS8V151J	150Ω×4	10
Z11	EXBV8V101J	100Ω×4	1
Z12	EXBS8V102J	1kΩ×4	1
Z13~15	EXBS8V151J	150Ω×4	3
Z16~19	EXBS8V472J	4.7kΩ×4	4
Z20, 21	EXBV8V101J	100Ω×4	2
Z22	EXBV8V221J	220Ω×4	1
Z23, 24	EXBV8V101J	100Ω×4	2
RESISTORS			
R1	ERJ6GEYJ103V	10kΩ	1
R2	ERJ6GEYJ221V	220Ω	1
R3	ERJ6GEYJ102V	1kΩ	1
R4	ERJ6GEYJ222V	2.2kΩ	1
R5	ERJ6GEYJ102V	1kΩ	1
R6, 7	ERJ6GEYJ103V	10kΩ	2
R8	ERJ6GEYJ104V	100kΩ	1
R9	ERJ6GEYJ154V	150kΩ	1
R10	ERJ6GEYJ102V	1kΩ	1
R11	ERJ6GEYJ472V	4.7kΩ	1
R12	ERJ6GEYJ101V	100Ω	1
R13, 14	ERJ6GEYJ222V	2.2kΩ	2
R15	ERJ6GEYJ472V	4.7kΩ	1
R16, 17	ERJ6GEYJ101V	100Ω	2
R18	ERJ6GEYJ103V	10kΩ	1
R19	ERJ6GEYJ472V	4.7kΩ	1
R20	ERJ6GEYJ222V	2.2kΩ	1
R21	ERJ6GEYJ221V	220Ω	1
R22, 23	ERJ6GEYJ222V	2.2kΩ	2
R24	ERJ6GEYJ103V	10kΩ	1
R25	ERJ6GEYJ221V	220Ω	1
R26	ERJ6GEYJ101V	100Ω	1
R27, 28	ERJ6GEYJ221V	220Ω	2
R29	ERJ6GEYJ330V	33Ω	1

	Ref. No.	Part No.	Description	P/S
	R30	ERJ6GEYJ182V	1.8kΩ	1
	R31	ERJ6GEYJ473V	47kΩ	1
	R32, 33	ERJ6GEYJ103V	10kΩ	2
	R34, 35	ERJ6GEYJ101V	100Ω	2
	R36	ERJ6GEYJ472V	4.7kΩ	1
	R37	ERJ6GEYJ473V	47kΩ	1
	R38	ERJ6GEYJ472V	4.7kΩ, EN MC EK EZ EW EF EA EH EP X XL XR XS XD XT XP	1
	R39	ERJ6GEYJ472V	4.7kΩ, M XM	1
	R40, 41	ERJ6GEYJ101V	100Ω	2
	R42	ERJ6GEYJ103V	10kΩ	1
	R43, 44	ERJ6GEYJ221V	220Ω	2
	R45	ERJ6GEYJ103V	10kΩ	1
	R46	ERJ6GEYJ221V	220Ω	1
	R47~49	ERJ6GEYJ101V	100Ω	3
	R50	ERJ6GEYJ151V	150Ω	1
	R51	ERJ6GEYJ471V	470Ω	1
	R52	ERJ6GEYJ332V	3.3kΩ	1
	CAPACITORS			
	C1~4	ECUV1H104ZFX	0.1μF	4
	C5, 6	ECUV1H220JCN	22pF	2
	C7	ECUV1E224ZFX	0.22μF	1
	C8	ECUV1H101JG	100pF	1
	C9~21	ECUV1H104ZFX	0.1μF	13
	C22, 23	ECUV1H220JCN	22pF	2
	C24~26	ECUV1H104ZFX	0.1μF	3
	C27	ECUV1H101JG	100pF	1
	C28, 29	ECUV1H220JCN	22pF	2
	C30	ECUV1H101JG	100pF	1
	C31~34	ECUV1H104ZFX	0.1μF	4
	C35, 36	ECUV1H101JG	100pF	2
	C37	ECUV1H104ZFX	0.1μF	1
	C38	ECEA0JU102	1000μF, 6.3V	1
	C39	ECUV1H104ZFX	0.1μF	1
	C40~43	ECUV1H101JG	100pF	4
	C44, 45	EECS5R5V105	1F, 5.5V, Memory Back-up	2
	C46, 47	ECUV1H104ZFX	0.1μF	2
	C48, 50~53	ECUV1H101JG	100pF	5

FAJ FILTER & AMP CIRCUIT

	Ref. No.	Part No.	Description	P/S
	INTEGRATED CIRCUITS			
	IC1	LA4705	Power Amplifier	1
	IC2	PCM69AP	Dynamic Noise Reduction	1
	IC3, 4	M5218AL	Operational Amplifier	2
	IC5	SVIGM5216LL	Operational Amplifier	1
	IC6	M5218AL	Operational Amplifier	1
○	IC7 ⚠	PQ05RF2	+5V Voltage Regulator	1
	IC8	QCPL-260L	Photo Coupler	1
	TRANSISTORS			
S	Q1~3	2SA1015-GR	2SA933STRS (SUB. Part)	3
	Q8	2SA1534AR	Transistor	1
S	Q16	2SC1815GR	Transistor	1

	Ref. No.	Part No.	Description	P/S
	DIODES			
	D1~7	MA165	Diode	7
	D8	EK04	Diode	1
	D9, 10 ⚠	SVDGERA1502	Rectifier	2
	D11~14 ⚠	SVDS3V20	Rectifier	4
	D15, 16	MA165	Diode	2
	D18	MA4051	Zener, 5.1V	1
	D19, 21 ⚠	SVDGERA1502	Rectifier	2
	D22	MA4051	Zener, 5.1V	1
	COILS			
	L1, 3~6	QLQGT3T150SA	Coil	5
	L7	QLQGT1B800MA	Coil	1
	JACKS			
	JK1	SJSG1370A	MIDI THRU	1
	JK2	SJSG1370A	MIDI OUT	1
	JK3	SJSG1370A	MIDI IN	1
	JK4	SJJG100A	EXP PEDAL	1
	JK5	QJJG003AA	FOOT SW	1
	JK8	QJJG003AA	LINE OUT L	1
	JK9	QJJG003AA	LINE OUT R	1
	JK10	SJJG100A	PHONES	1
	RESISTORS			
	R1, 3	ERDS2TJ680	68Ω	2
	R4	ERDS2TJ330	33Ω	1
	R5	ERDS2TJ104	100kΩ	1
	R7	ERDS2TJ151	150Ω	1
	R8	ERDS2TJ103	10kΩ	1
	R9	ERDS2TJ102	1kΩ	1
	R10	ERDS2TJ221	220Ω	1
	R11	ERDS2TJ104	100kΩ	1
	R12, 13	ERDS2TJ102	1kΩ	2
○	R16 ⚠	ERQ12AJ2R2	2.2Ω, 1/2W, Fuse Type	1
	R20, 21	ERDS2TJ103	10kΩ	2
	R22 ⚠	ERD2FCVG100	10Ω, 1/4W, Fuse Type	1
	R23, 24 ⚠	ERG1SJ330	33Ω, 1W	2
	R25	ERDS2TJ332	3.3kΩ	1
	R26	ERDS2TJ102	1kΩ	1
	R27 ⚠	ERQ2CJP2R0S	2Ω, 2W, Fuse Type	1
	R38	ERDS2TJ103	10kΩ	1
	R42	ERDS2TJ152	1.5kΩ	1
	R43~46	ERDS2TJ153	15kΩ	4
	R54, 55 ⚠	ERD2FCG220	22Ω, 1/4W, Fuse Type	2
	R65~68	ERDS2TJ333	33kΩ	4
	R69, 70	ERDS2TJ222	2.2kΩ	2
	R71, 72	ERDS2TJ102	1kΩ	2
	R73, 74	ERDS2TJ103	10kΩ	2
	R76	ERDS2TJ152	1.5kΩ	1
	R77	ERDS2TJ473	47kΩ	1
	R78	ERDS2TJ103	10kΩ	1
	R79, 80	ERDS2TJ104	100kΩ	2
	R81, 82, 85, 86	ERDS2TJ102	1kΩ	4
	R87, 88	ERDS2TJ222	2.2kΩ	2
	R89~92 ⚠	ERD25FVJ2R2	2.2Ω, 1/4W, Flame-Ploof	4
	R98, 99	ERDS2TJ102	1kΩ	2
	R100~102	ERDS2TJ471	470Ω	3
	R103	ERDS2TJ152	1.5kΩ	1
	R115, 116	ERDS2TJ104	100kΩ	2
	R117, 118	ERDS2TJ102	1kΩ	2
	R171	ERDS2TJ473	47kΩ	1
	R172, 173	ERDS2TJ154	150kΩ	2
	R175	ERDS2TJ184	180kΩ	1

Ref. No.	Part No.	Description	P/S
R176, 177	ERDS2TJ154	150kΩ	2
R178	ERDS2TJ184	180kΩ	1
R179	ERDS2TJ473	47kΩ	1
CAPACITORS			
C1, 2	ECCR1H221J	220pF	2
C4~7	ECKR1E473ZV	0.047μF	4
C11	ECEA1CU102	1000μF, 16V	1
C17, 18	ECEA0JKA470	47μF, 6.3V	2
C19	ECKR1E473ZV	0.047μF	1
C20	ECEA0JU471	470μF, 6.3V	1
C27	ECEA1CKA100	10μF, 16V	1
C28, 29	ECEA1CKA101	100μF, 16V	2
C30	ECA1EM682E	6800μF, 25V	1
C31, 32	ECEA1CKA101	100μF, 16V	2
C34, 35	ECQB1H103JF	0.01μF	2
C36	ECKR1E473ZV	0.047μF	1
C37	ECEA0JKA101	100μF, 6.3V	1
C39, 40	ECCR1H221J	220pF	2
C41, 42	ECQB1H332JF	0.0033μF	2
C43, 44	ECEA0JKA101	100μF, 6.3V	2
C50	ECRF1H104ZF	0.1μF	1
C59~62	ECQB1H333JF	0.033μF	4
C67, 68	ECQV1H104JM	0.1μF	2
C69, 70	ECQB1H222JF	0.0022μF	2
C71, 72	ECCR1H220J	22pF	2
C75~78	ECRF1H104ZF	0.1μF	4
C83	ECEA0JKA101	100μF, 6.3V	1
C84 ⚠	ECQE1A104M6	0.1μF, 125V	1
C87	ECEA1EU101	100μF, 25V	1
C88	ECRF1H104ZF	0.1μF	1
C92, 93	ECKR1E473ZV	0.047μF	2
C100	ECRF1H104ZF	0.1μF	1
C101, 102	ECKR1E473ZV	0.047μF	2
C104	ECCR1H681J	680pF	1
C105	ECCR1H151J	150pF	1
C106	ECCR1H220J	22pF	1
C110	ECCR1H681J	680pF	1
C111	ECCR1H151J	150pF	1
C112	ECCR1H220J	22pF	1
C120, 121	ECCR1H101J	100pF	2
C122, 123	ECEA1HKN010	1μF, 50V	2

ACP AC POWER SUPPLY CIRCUIT

Ref. No.	Part No.	Description	P/S
LINE FILTER			
L1 ⚠	SLTGLF3	Line Filter	1
JACK			
JK1 ⚠	SJVD0203B	AC Inlet	1
SWITCH			
S1 ⚠	SSRG100A	Voltage Selector, X XR XS XD XT	1
FUSES			
F1 ⚠	XBA1C16NU100	1.6A, 125V, M MC XM	1
F1 ⚠	XBA2C10TB0	T1.0A, 250V, X XR XS XD XT	1
F2 ⚠	XBA2C05TB0	T500mAL, 250V, X XR XS XD XT	1
F3 ⚠	XBA2C05TB0	T500mAL, 250V, EN EK EZ EW EF EA EH EP XL XP X XR XS XD XT	1
CAPACITORS			
C1 ⚠	ECKCVA1472MF	4700pF, Line Capacitor	1
C2 ⚠	ECQU2A104MT	0.1μF, 250V, Across the Line Capacitor	1

CP1 CONTROL PANE 1 CIRCUIT

Ref. No.	Part No.	Description	P/S
INTEGRATED CIRCUITS			
IC1	M37471M2196S	16 bit Microcomputer	1
IC2	HD74LS138P	3 to 8 Decoder	1
IC3~5	HD74LS07P	Hex Buffers	3
TRANSISTORS			
Q1~8	2SA830SB	Transistor	8
DIODES			
D49~64, 73~78, 81~94, 97~103, 105~111, 113~120	MA165	Diode	58
D239, 240, 247, 248, 263, 264, 266~269, 273~275, 280~282, 308, 318	LN282R	LED (Red)	18
D255, 256, 277, 278, 294~298, 301~305, 309~313, 315~317, 319	LN382G	LED (Green)	23
OSCILLATOR			
X1	SVQGT4MGW100	4MHz, Ceramic Oscillator	1
COMPONENT COMBINATION			
Z1	EXBPI8103JM	10kΩ×8	1
SWITCHES			
S49~64, 73~78, 81~94, 97~103, 105~111, 113~120	EVQ21507K	Push Switch	58
IC PROTECTOR			
IP1 ⚠	ICP-N10T104	IC Protector	1
RESISTORS			
R1~8, 10~15	ERDS2TJ680	68Ω	14
R24~31	ERDS2TJ103	10kΩ	8
R32	ERDS2TJ333	33kΩ	1

Ref. No.	Part No.	Description	P/S
R33	ERDS2TJ101	100Ω	1
R34	ERDS2TJ680	68Ω	1
R40~43	ERDS2TJ102	1kΩ	4
CAPACITORS			
C1~5	ECRF1H104ZF	0.1μF	5
C9	ECEA0JKA221	220μF, 6.3V	1
C12~16	ECRF1H104ZF	0.1μF	5

CP2 CONTROL PANEL 2 CIRCUIT

Ref. No.	Part No.	Description	P/S
DIODES			
D1~30, 33~38, 41~48	MA165	Diode	44
D201~203, 206, 213, 214, 220~222, 226~230	LN282R	LED (Red)	14
D204, 205, 209~212, 217~219, 233	LN382G	LED (Green)	10
SWITCHES			
S1~30, 33~38, 41~48	EVQ21507K	Push Switch	44
VARIABLE RESISTOR			
VR1	EVD07205B24G	20kΩ B, MAIN VOLUME	1

CP3 CONTROL PANEL 3 CIRCUIT

Ref. No.	Part No.	Description	P/S
DIODES			
D65, 66, 69~71	MA165	Diode	5
D160	LN382G	LED (Green)	1
D170	LN282R	LED (Red)	1
SWITCHES			
S65, 66, 69~71	EVQ21507K	Push Switch	5

MKB1 MANUAL KEYBOARD 1 CIRCUIT

Ref. No.	Part No.	Description	P/S
INTEGRATED CIRCUIT			
IC1	HD74LS138P	3 to 8 Decoder	1
DIODES			
D1~48	MA165	Diode	48
CAPACITORS			
C2, 3	ECRF1H104ZF	0.1μF	2

MKB2 MANUAL KEYBOARD 2 CIRCUIT

Ref. No.	Part No.	Description	P/S
INTEGRATED CIRCUIT			
IC2	HD74LS138P	3 to 8 Decoder	1
DIODES			
D49~96	MA165	Diode	48
CAPACITORS			
C4, 5	ECRF1H104ZF	0.1μF	2
C6	ECEA1CKA470	47μF, 16V	1

MKB3 MANUAL KEYBOARD 3 CIRCUIT

Ref. No.	Part No.	Description	P/S
DIODES			
D97~122	MA165	Diode	26

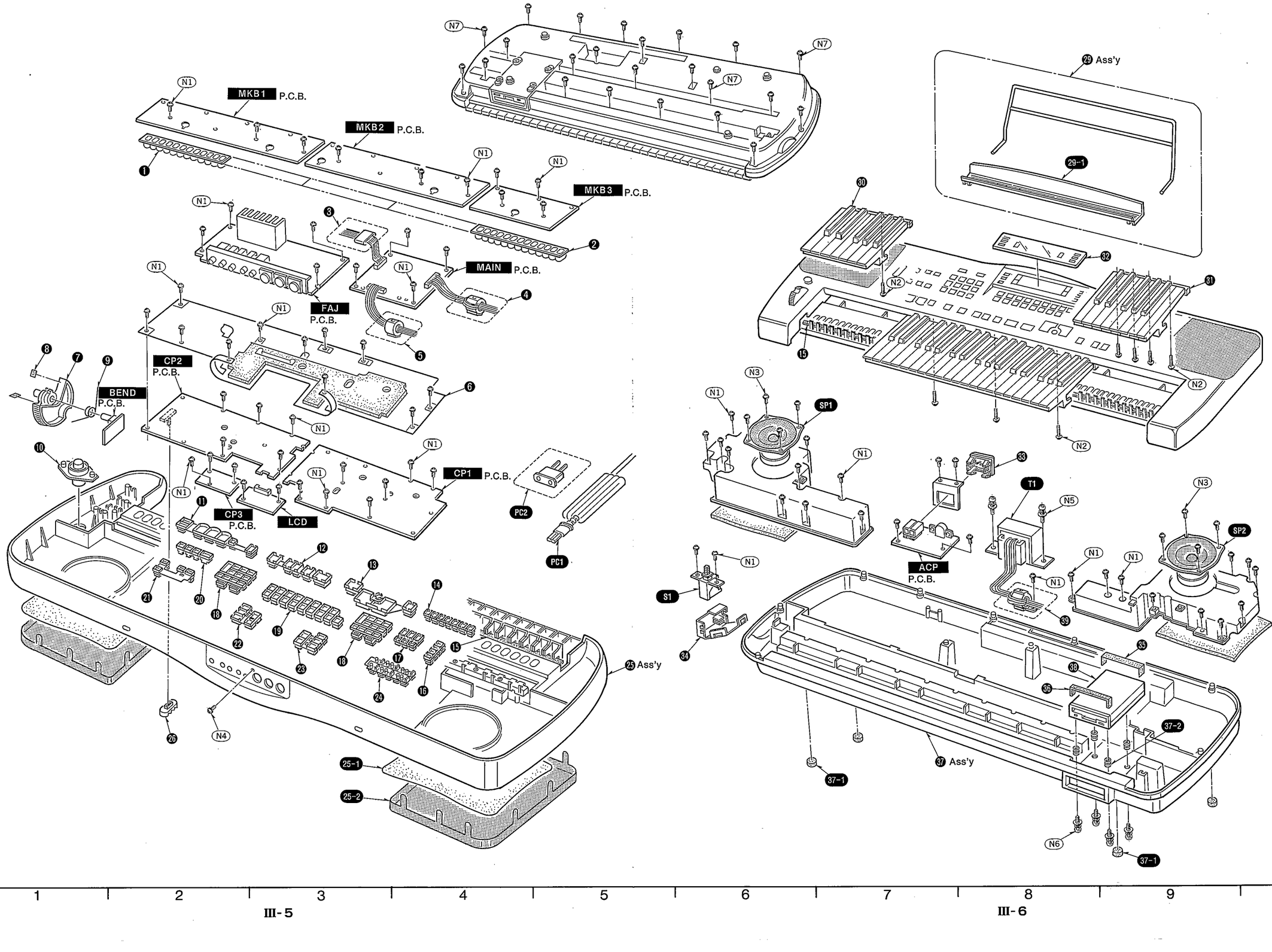
BEND PITCH BEND CIRCUIT

Ref. No.	Part No.	Description	P/S
VARIABLE RESISTOR			
VR1	QRVG16A02B54	50kΩ, B	1
RESISTORS			
R1, 2	ER0S2CKF1001	1kΩ, ±1%	2

■ WIRING PARTS

Ref. No.	Part No.	Description	P/S
○ W1	QEXGSS10035B	Connector with Wire	1
○ W2	QEXGSS12045B	Connector with Wire	1
○ W3	QEXGZA34060A	Connector with Wire	1
○ W4	QEXGSS10020B	Connector with Wire	1
W5	QEXGSS15025B	Connector with Wire	1
○ W6	QEXGVH06060C	Connector with Wire	1
W7	QEXGVH03035B	Connector with Wire	1
○ W8	QEXGSA07007B	Connector with Wire	1

CABINET PARTS LOCATION



III-5 III-6

REPLACEMENT PARTS LIST.....Cabinet and Chassis Parts

Notes:

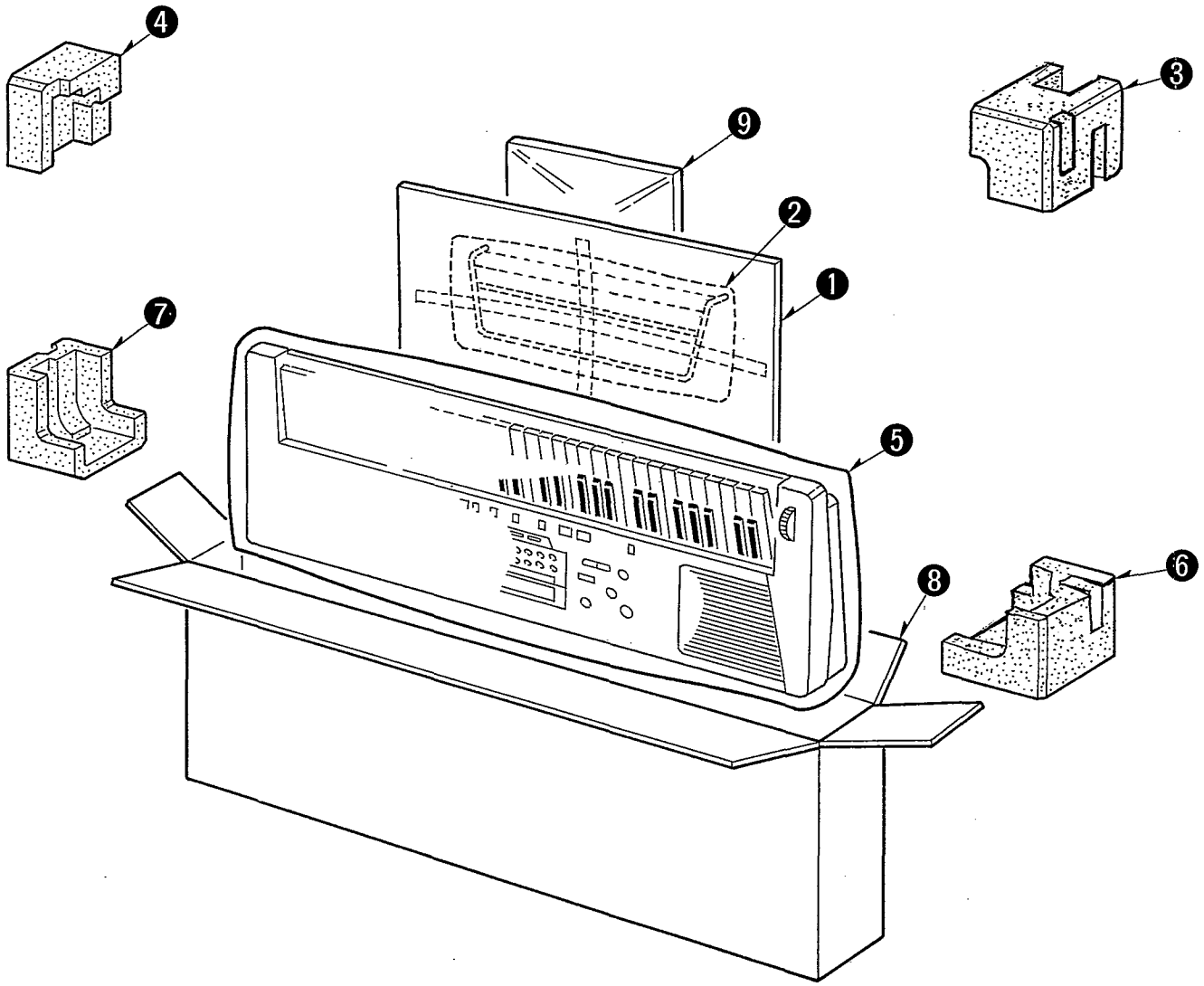
1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retension period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. ○ mark are new parts.
3. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
4. For part No. with area mark, check the area when placing an order.
5. The raw material indication for synthtic resin
   In order to facilitate classification of parts of synthetic resin manufacture and to promote the recycling of natural resources, a raw material symbol for such parts is indicated in the Ref. No./Material column.

■ CABINET & CHASSIS PARTS

	Ref. No.		Part No.	Description	P/S
			SWITCH		
	S1	⚠	ESB823V	Power Switch	1
			SPEAKERS		
	SP1, 2		EAS12P458A3	Speaker, 12cm 4Ω	2
			TRANSFORMER		
○	T1	⚠	QTPG1M031B	Power Transformer, EN EK EZ EW EF EA EH EP X XL XR XS XD XT XP	1
○	T1	⚠	QTPG1M032B	Power Transformer, M MC XM	1
			POWER CORD & PLUG		
	PC1	⚠	QJAG013AA	Power Cord, M MC XM	1
	PC1	⚠	QJAG014AA	Power Cord, XL XR	1
	PC1	⚠	SJAG65	Power Cord, EN EZ EW EF EA EH EP X XS XT XP	1
	PC1	⚠	VJA0733	Power Cord, EK XD	1
	PC2	⚠	SJP5213-1	Attachment Plug, X XT XP	1
			CABINET PARTS		
○	1		QMWG6015CAK	Rubber Switch (12 pcs. on one)	4
○	2		QMWG6014CAK	Rubber Switch (13 pcs. on one)	1
○	3		QLZG013A	Core, EN M MC EK EZ EW EF EA EH EP XL XM	1
	4		QLZG006A	Core, EN EK EZ EW EF EA EH EP XL	1
	5		QLZG005A	Core, M MC XM	1
○	6		QSCG084AK	Shield	1
	7		SBNG4050A	Wheel Knob	1
	8		QMFG4076AAK	Felt	2
○	9		QMBG012AAK	Spring	1
○	10		QGUG1407AAK	Button, Power Switch	1
○	11		QGUG1396AAK	Button	1
○	12		QGUG1401AAK	Button	1
○	13		QGUG1402AAK	Button	1

	Ref. No.		Part No.	Description	P/S
○	14		QGUG1405AAK	Button	1
	15		SHSG1970A	Felt	2
○	16		QGUG1406AAK	Button	1
○	17		QGUG1404AAK	Button	1
○	18		QGUG1397AAK	Button	2
○	19		QGUG1400AAK	Button	1
○	20		QGUG1395AAK	Button	1
○	21		QGUG1394AAK	Button	1
○	22		QGUG1398AAK	Button	1
○	23		QGUG1399AAK	Button	1
○	24		QGUG1403AAK	Button	1
○	25		QYPG1061ABK	Control Panel Ass'y	1
○	25-1		QKNG1024A01K	Speaker Net	2
○	25-2		QGMG0015AAK	Panching Metal Net	2
	26		SBNG7070B	Knob, Main Volume	1
○	29	S	QYAG3004AAK	Music Stand Ass'y	1
○	29-1		QMRG7065AAK	Table of Music Book	1
	30	ABS	QMWG9020AAK	12 Keys	4
	31	ABS	QMWG9021AAK	13 Keys	1
○	32		QKWG022AAK	LCD Panel	1
	33	⚠	SJS9231A	AC Inlet Cover, EN EK EZ EW EF EA EH EP X XS XD XT XP	1
	33	⚠	SJS9334A	AC Inlet Cover, M MC XM XL XR	1
	34		SHRG8390A	Cover, Power SW.	1
	35		QMFG4103AA	Felt	1
○	36		QMFG1204AA	Felt	1
○	37		QYKG181BAK	Bottom Case Ass'y	1
○	37-1		QMRG7070AAK	Foot	4
	37-2		QMGG041AA	Spacer	4
	38		QAUG012AA	DDR Drive Unit	1
	39		QLZG006A	Core, EN M MC EK EZ EW EF EA EH EP XL XM	1
			SCREWS		
	N1		XTW3+10Q	Screw	60
	N2		XTW3+20Q	Screw	8
	N3		XTW3+10QFZ	Screw	8
○	N4		XTB3+12JFZ	Screw	3
	N5		QHDG002AA	Screw with Washer	2
○	N6		QHDG043AA	Screw with Washer	4
	N7		XTW3+20QFZ	Screw	23

PACKING



■ PACKING PARTS

Ref. No.	Part No.	Description	P/S
PACKING PARTS			
○ 1	QPNG0531AAK	Card Board	1
2 PE	SPHG1770A	Polyethylene Bag	1
○ 3 PS	QPNG0530AAK	Pad	1
○ 4 PS	QPNG0529AAK	Pad	1
5 PE	QPFG002AA	Polyethylene Bag	1
○ 6 PS	QPNG0528AAK	Pad	1
○ 7 PS	QPNG0527AAK	Pad	1
○ 8	QPGG0314AAK	Carton	1
OPERATING INSTRUCTION MANUAL			
○ 9	QQFGKN901AA	Operating instruction manual, EN	1
○ 9-1	QQTG0335A	DANSK	1
○ 9-2	QQTG0337A	ENGLISH	1
○ 9	QQFGKN901CA	Operating instruction manual, M	1
○ 9	QQFGKN901DA	Operating instruction manual, MC	1
○ 9-1	QQTG0337A	ENGLISH	1
○ 9-2	QQTG0338A	FRANCAIS	1
○ 9	QQFGKN901EA	Operating instruction manual, EK XL XR XS	1
○ 9	QQFGKN901FA	Operating instruction manual, EA	1
○ 9	QQFGKN901GA	Operating instruction manual, EW	1
○ 9-1	QQTG0338A	FRANCAIS	1
○ 9-2	QQTG0339A	DEUTSCH	1
○ 9-3	QQTG0340A	ITALIANO	1
○ 9	QQFGKN901HA	Operating instruction manual, EF	1
○ 9-1	QQTG0338A	FRANCAIS	1
○ 9-2	QQTG0340A	ITALIANO	1
○ 9	QQFGKN901JA	Operating instruction manual, EH	1
○ 9-1	QQTG0341A	NERDERLANDS	1
○ 9-2	QQTG0338A	FRANCAIS	1
○ 9-3	QQTG0339A	DEUTSCH	1
○ 9	QQFGKN901KA	Operating instruction manual, EP XM XP	1
○ 9-1	QQTG0337A	ENGLISH	1
○ 9-2	QQTG0342A	ESPANOL	1
○ 9	QQFGKN901LA	Operating instruction manual, X	1
○ 9-1	QQTG0337A	ENGLISH	1
○ 9-2	QQTG0342A	ESPANOL	1
○ 9-3	QQTG0343A	中文	1
○ 9	QQFGKN901MA	Operating instruction manual, XT	1
○ 9	QQFGKN901NA	Operating instruction manual, XD	1
○ 9-1	QQTG0337A	ENGLISH	1
○ 9-2	QQTG0343A	中文	1
○ 9	QQFGKN901PA	Operating instruction manual, EZ	1

669

Printed in Japan
95063450 Ⓗ K.K./H.K.